



User Manual
PRORUNNER Mk9
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1 About this manual

1.1 Introduction

This manual provides information about the PRORUNNER Mk9 machine, that is used for the vertical movement of goods within a transport system. From here in the manual, the PRORUNNER Mk9 will be referred to as the “machine”.

This manual it intended for:

- Retailers/Original Equipment Manufacturers (OEM) project engineers and mechanics.
- Operator, installation and maintenance engineer users.

It is important to carefully read this manual as soon as possible after purchase of the machine.

System integrators/OEMs

This manual explains machine configurations you can use to setup the machine. It also provides instructions on how to add or change the machine technical components.

Users

The machine may be supplied pre-assembled, if so, some chapters in this manual will not be applicable. To integrate the machine within a transport system, Qimarox advises you to refer to documentation provided by the OEM of the transport system.

1.2 Product documentation

Document	Reference
Machine manuals*	UM-PRORUNNER_Mk9-1.0-EN
Machine layout drawing**	Refer to section 2.2
OEM parts of the machine: <ul style="list-style-type: none"> • Bolts and nuts • Motor reductor • Photocells • Runners • Chain • Induction switches • Belts 	

* Generic information for each machine, apart from exceptions outlined in the machine layout drawing.

** Machine specific information.

1.3 Source language

This manual was originally written in the English language.

1.4 Symbols used in the manual

The following symbols are used in this manual.



WARNING

Risk of serious injury to the user if the instructions are not accurately followed.



CAUTION

Risk of damage to the machine if the instructions are not accurately followed.



Note

To provide additional information to the user about a task or issue.



Tip

A tip or point of attention for carrying out a task.

1.5 Terminology list

The table below explains common terms used by Qimarox for the machine.

Term	Definition
supply conveyor	The conveyor that delivers product to the infeed conveyor on the machine. The supply conveyor is not part of the machine.
discharge conveyor	The conveyor that discharges products from the machine. The discharge conveyor is not part of the machine.
assemble	Assembly of the machine.
fenced area	Area around the machine that unauthorised personnel cannot enter for safety reasons.
fixed conveyor	The fixed conveyor is not moveable, and can feed or discharge products. The fixed conveyor is part of the machine.
trolley	The component to which the moveable conveyor is mounted. Refer to section 4.2.6 and the exploded view illustration in chapter 11.
machine	The PRORUNNER Mk9.
installation	Installation of the machine within a transport system.
product	Products transported by the machine.
moveable conveyor	The moveable conveyor is fixed to the product transporter. The moveable conveyor is part of the machine.

1.6 Further support and information

Qimarox can supply additional expertise and support services, for:

- Training
- Global support
- Service contracts

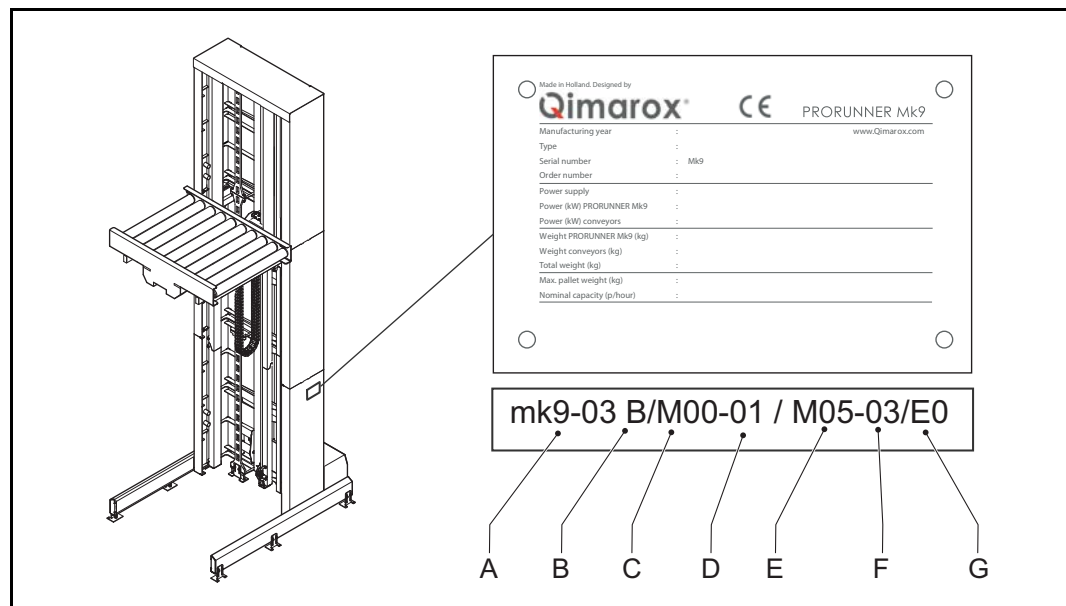
For more information please contact Qimarox.

2 General

2.1 Machine identification

The machine identification is given on the type plate. The type plate is located on the side of the lift.

The type on the type plate has a code consisting of 7 parts (A - G). This indicates in detail what machine type is involved.



- A type lift drive
- B type column
- C type productconveyor moveable
- D type drive productconveyor moveable
- E type productconveyor fixed position
- F type drive productconveyor fixed position
- G type E components

Column type:

- KS Standard column

Carrier type:

- DB Carrier with conveyor
- DZ Carrier without conveyor

fixed position type:

- UV Fixed outfeed conveyor

Code part	Remark	Possible value	Meaning of the value	Type	Refer to chapter
A	Lift drive type	00	None / not supplied	11	
		05	3 Phase ~ + BR + TF		12.1
		11	3 Phase ~ + BR + TF + encoder		12.1
		99	Other		
B	Column type	S	Column without sensors, no encoder on carrier	B	12.2
		B	Column with sensors, no encoder on carrier		12.2
		E	Column with sensors and encoder on carrier		12.2
C	Conveyor in elevator type	000	None / not supplied	000	
		F01	Fork		12.3
		M01	Roller conveyor		12.3
		M02	Roller chain conveyor		12.3
		999	Special version		
D	Conveyor in elevator type	00	None / not supplied	00	
		03	3 Phase ~		12.1
		05	3 Phase ~ + TF		12.1
		06	3 Phase ~ + BR		12.1
		07	3 Phase ~ + BR + TF		12.1
		99	Special version		
E	Fixed conveyor type	000	None / not supplied	000	
		M01	Roller conveyor		12.4
		M02	Roller chain conveyor		12.5
		999	Special version		
F	Fixed conveyor drive	00	None / not supplied		
		03	3 Phase ~		12.1
		05	3 Phase ~ + TF		12.1
		06	3 Phase ~ + BR		12.1
		07	3 Phase ~ + BR + TF		12.1
		99	Special version		
G	E-component out-feed type	E0	None / not supplied		
		E1	24 VDC IP66		
		E2	24 VDC IP67		
		99	Other		

After a machine order is placed, you will receive a machine drawing (see *Fig. 1*) and specifications sheet (see *Fig. 2*) for approval. After your approval you will receive an approved drawing and specification sheet which is used as a reference for this manual.

PROCURER m20 machine type code			Selection	Date
				MM/YY (11/2000-06/211)
A	Left drive type	00 Name / not supplied 01 2 Phase = 400 + 10 11 2 Phase = 400 + 10 + capacitor 20 2 Phase = 400 + 10 + capacitor 30 2 Phase = 400 + 100 40 Other	11	
B	Delivery type	1 Complete without sensors, not available on carrier 4 Complete with sensors, not available on carrier 5 Complete with sensor and available on carrier	4	
C	Controller in elevator type	00 Name / not supplied 01A Turb 01B Buffer controller 01C Buffer chain controller 01D Special version	01B	
D	Controller in elevator drive	00 Name / not supplied 01 2 Phase = 400 11 2 Phase = 400 20 2 Phase = 400 + 10 30 2 Phase = 400 + 100 40 Special version	01	
E	Speed controller type	000 Name / not supplied 001 Buffer controller 002 Buffer chain controller 003 Special version	001	
F	Speed controller drive	00 Name / not supplied 01 2 Phase = 400 11 2 Phase = 400 20 2 Phase = 400 + 10 30 2 Phase = 400 + 100 40 Special version	01	
G	in-component surfed type	00 Name / not supplied 11 2K VCC 006 21 2K VCC 007 30 Other	11	

- The machine serial number.
- Product dimensions and mass.
- Lift dimensions.
- Lift configuration.
- Motor specifications.
- The number of transport carriers.



Note
The machine layout drawing illustrated shows an example.

The machine can only be used according to the specifications given in this manual and the machine layout drawing specifications. If you want to use the machine outside the recommended specifications, you must contact Qimarox to check if this is possible. Inappropriate and/or modified use of the machine can result in dangerous safety issues and/or damage. You must obtain written confirmation from Qimarox before using the machine in a modified or unspecified manner. Qimarox cannot be held liable for any accidents and/or damages that may occur through inappropriate unauthorised use of the machine.

2.3 Warranty

The scope and duration of the warranty is agreed when an order is placed for the machine.

The warranty only applies if the machine is used according to the specifications and if the user and maintenance instructions are observed.

The warranty does not cover wear of the parts.

The machine warranty is null and void in cases of:

- Unskilled use.
- Inadequate maintenance.
- Unskilled maintenance.
- Modifications made to the machine without prior written permission from Qimarox.

2.4 Liability

Qimarox believes to the best of its knowledge that the information in this user manual is accurate. In the event that technical or typographical errors exist, Qimarox reserves the right to make changes to subsequent editions of this user manual without prior notice to holders of this edition. The reader should consult Qimarox if errors are suspected. In no event shall Qimarox be liable for any damages arising out of or related to this user manual or the information contained in it. EXCEPT AS SPECIFIED HEREIN, QIMAROX MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND EXPRESSLY DISCLAIMS ANY WARRANTY OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S RIGHT TO RECOVER DAMAGES CAUSED BY FAULT OR NEGLIGENCE ON THE PART OF QIMAROX SHALL BE LIMITED TO THE AMOUNT PAID TO QIMAROX BY THE CUSTOMER. QIMAROX SHALL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY THEREOF. This limitation of liability of Qimarox will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against Qimarox must be brought without one (1) year after that cause of action accrues.

Qimarox is not liable for damages, accidents, unsafe conditions, defects, malfunctions, or service failures caused by the following:

- Owner's or user's failure to follow Qimarox's installation, operation and maintenance instructions, including but not limited to neglecting warnings or regulations as shown on the PRORUNNER or in this manual.
- Usage of the PRORUNNER for other applications, or under other circumstances than indicated in this user manual. This includes abuse, misuse or negligent acts.
- Modifications of any kind to the machine. This includes the replacement of parts with parts that are not specified in this manual.
- Insufficient or improper maintenance.

2.5 CE Declaration of Conformity

The machine complies with essential requirements regarding safety and hygiene, refer to chapter 10.

3 Safety

3.1 Intended use of the machine

The machine is exclusively intended for the vertical transportation of goods, as described in this manual. Refer to section 4.3 for a detailed description of the specifications of use.

The machine is always set up within a larger transport system in which products are automatically loaded on and off the machine.

Any other use of the machine is strictly forbidden.

3.2 User types and qualifications

The following user types are referred to in this manual:

- The operator.
- The person setting up the machine.
- The electrical installer.
- The maintenance engineer.

The maintenance engineer must be familiar with the full content of this manual.

Before any person operates, sets up, electrically installs or maintains the machine, permission to carry out these tasks must be obtained from Qimarox. Qimarox determines if the person is qualified for carrying out the given task. The machine should only be operated by qualified personnel.

An electrical installer is only qualified if a person has attended appropriate training and/or attained appropriate industry standard recognized qualifications. Qimarox can provide training if required.

Qimarox can also give advice about actions and tasks to be carried out on the machine.

3.3 Safety instructions

3.3.1 General

- Comply with the safety regulations given in this manual. Deviation from these regulations can lead to unacceptable risks.
- Never close doors (if present) in the fenced area of the machine, when personnel are inside this area.
- Switch off the machine and secure the main power supply switch in the off position with a padlock to prevent the machine from being switched on while personnel work in the fenced area.
- Comply with all relevant local legislation and regulations.

3.3.2 Set up

- Connect the machine in accordance with the local laws and regulations concerning safety and health.
- Before putting the machine into use, check if the machine has been set up in accordance with the instructions in this manual and with the layout drawing.
- Make sure that the transport system complies with all relevant health and safety directives and regulations.

3.3.3 Start the machine

- Do not switch the main power supply on when persons are in contact with the machine.
- Do not start the machine when persons are in contact with the machine.
- Do not start the machine when persons are present in the danger zone of the machine.
- Before the machine is put into operation, all machine parts must comply with all relevant health and safety directives and regulations.

3.3.4 During machine operation

- Keep your hands and feet away from danger zones.
- Make sure you do not wear loose clothing and secure long or loose hair.
- Make sure that no persons or objects are within the range of any moving parts of the machine.
- Make sure that users know and observe all safety rules with regard to the machine and the environment in which it operates.

3.3.5 Maintenance and repair

- Turn the power off the machine using the main power supply switch before starting any maintenance or repair tasks. Secure the main power supply switch in the off position with a padlock.
- Replace damaged or defective parts before putting the machine back into operation.
- Changes and modifications that may affect the safety of the machine can only be carried out when these changes and modifications comply with the relevant regulations, legislation, directives and recognized industry standards.
If changes and modifications are outside the scope of specifications given by Qimarox in this manual and Qimarox has not granted permission changes and modifications, then the changes and modifications will entirely be the responsibility of those persons responsible for carrying out the changes and modifications.
- Electrical installation tasks must only be carried out by qualified personnel.

3.4 Safety equipment

- You must not disassemble, bypass or disable any safety equipment on the machine.
- The machine may not be started and must be immediately taken out of operation if even a single item of machine safety equipment is defective.
- After maintenance tasks are complete, always replace all safety equipment that have been removed from the machine.

The machine has been equipped with the following safety equipment:

- Covers
- Safety fencing

- Safety pressure valve (pneumatic system for drop-down safety)
- Drop-down safety system

**Note**

Replace labels on the machine if they become unreadable or damaged.

Qimarox requires a protection fenced area around the machine. Any access doors must be secured with (interlock) door switches. These switches must be included in the emergency stop and safety circuit. Refer to section 5.3 for information about how to set up the fenced area.

In case of non-compliance with the required safety measures, the CE Declaration of Conformity will become null and void.

3.5 Potential risks

The machine is intended to be integrated into a transport system. Qimarox has attempted to protect against as many hazards as possible. The following potential risks should be addressed before machine and assembled parts are put into operation:

- Risk of injury caused by falling products.
- Risk of injury as a result of moving product carrier.
- Hazards occurring at places where the machine connects to other parts of the production line, such as supply and discharge conveyors.

The interior of the machine can be accessed by removing the back covers or directly from the front. Additional protection (fencing) is required for the supply, discharge, infeed and outfeed conveyors.

The back side of the machine does not need extra protection. But when one can reach over the top of the vertical conveyor at the rear side it is needed to place additional fencing to prevent this access.

If the machine is accessible from multiple levels, then protection measures should be taken to avoid hazards. Please note that additional, local, rules or laws may apply and need you to take additional actions.

3.6 Machine end of life and environment disposal

Proper use and maintenance of the machine will not involve any environmental risks. After the machine is no longer useable, the machine should be dismantled and disposed of in an environmentally responsible manner.



WARNING

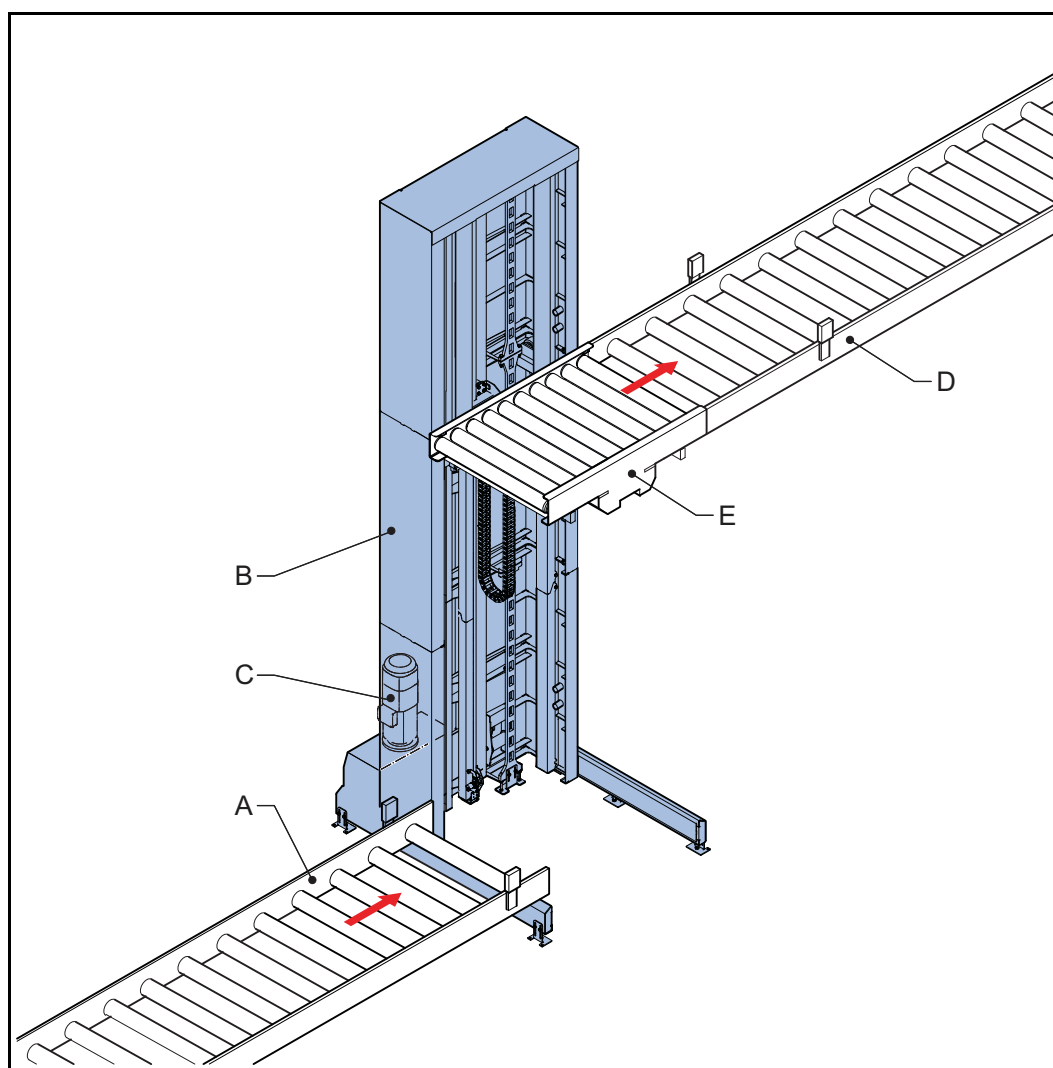
Observe all relevant legislation, regulations, instructions and precautions with regard to health and safety when dismantling the machine.

Observe all relevant legislation, regulations, instructions and precautions with regard to the disposal of products in the environment.

4 Description

4.1 Overview of parts

4.1.1 General overview



- A Supply conveyor (not supplied by Qimarox)
- B Lift column
- C Motor
- D Discharge conveyor (not supplied by Qimarox)
- E Product conveyor

The machine can consist of:

- Mechanical construction.
- Mechanical construction and electric sensors.
- Mechanical construction, electric sensors and cabling to the terminal module.
- Mechanical construction, electric sensors to the terminal module and a control box including control and software.

4.1.2 Motor

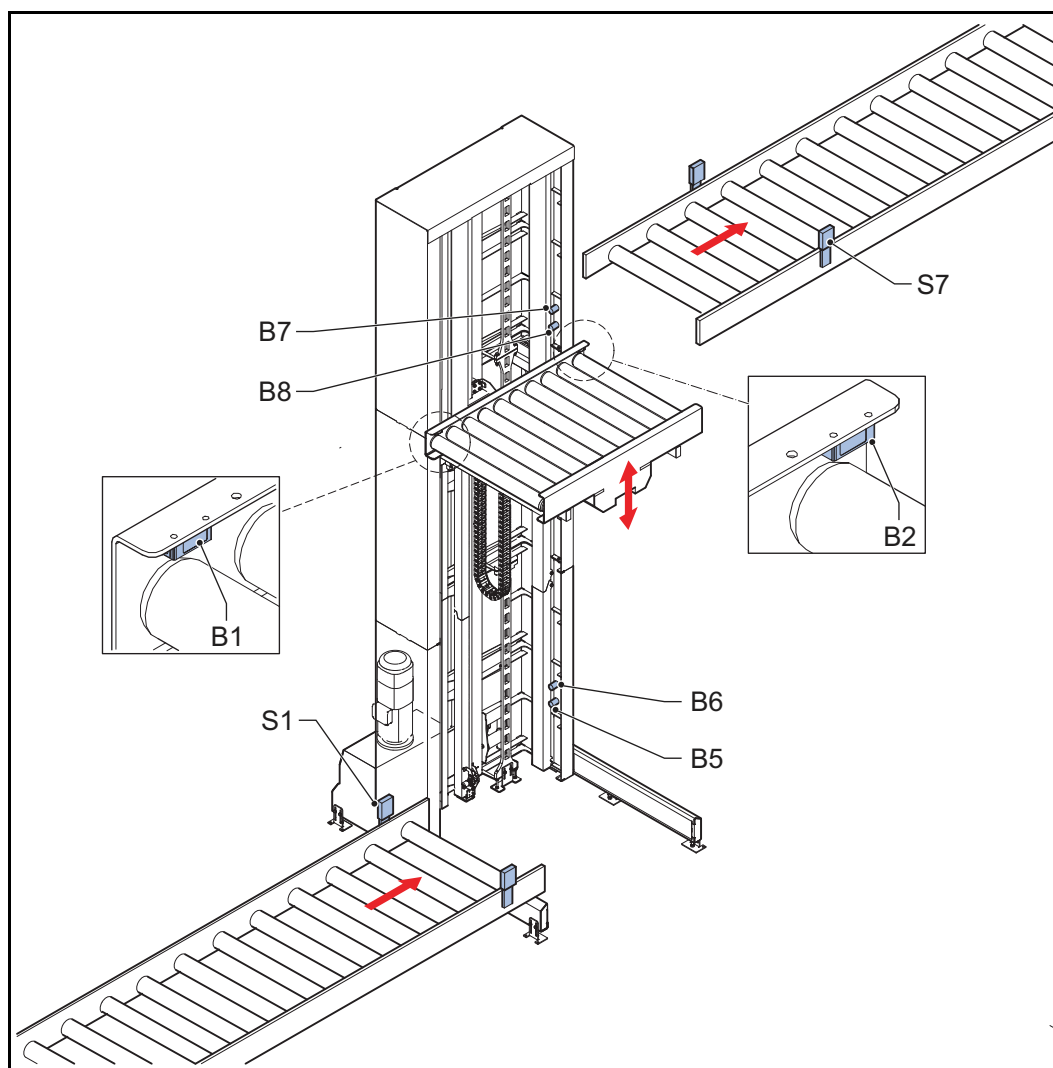
The motor drives the movement of the product conveyor. It is necessary to control the motor with a frequency controller for controlled start/stop and optimum adjustment of the rotation speed to the supply speed. If a frequency controller is used, EMC directives must be observed and the device should be installed according to the manufacturer specifications.

The product conveyor may also have a motor fitted. For specifications, refer to the machine layout drawing.

The PRORUNNER Mk9 should always be controlled by a frequency inverter for acceleration / deceleration. Please note; when using a frequency inverter for hoisting applications, a braking resistor should be provided also, in order to dispense the energy generated by the drive motor when travelling down. If there is no braking resistor the energy causes to high voltage inside the frequency inverter.

When a resistor has been connected, it might be necessary to change some parameters of the frequency inverter (please consult your frequency inverter supplier since it depends on the inverter brand).

4.2 Working principle



- B1 Left side of carrier clear / not clear
- B2 Right side of carrier clear / not clear
- B5 Stop transporter down sensor
- B6 Reduce speed down sensor
- B7 Stop transporter up sensor
- B8 Reduce speed up sensor
- S1 Count photocell (not supplied by Qimarox)
- S7 Discharge empty photocell (not supplied by Qimarox)

The machine works discontinuously. The product conveyor transports products from a predetermined low level to a predetermined high level.

The following sensors must be installed on the machine:

Sensor code	Sensor name	Refer to section
B1	left side of carrier clear / not clear	4.2.2
B2	right side of carrier clear / not clear	4.2.7
B5	Stop transporter down sensor	4.2.4
B6	Reduce speed down sensor	4.2.4
B7	Stop transporter up sensor	4.2.7
B8	Reduce speed up sensor	4.2.7
S1	Count photocell. (not supplied by Qimarox)	4.2.2
S7	Discharge empty photocell (not supplied by Qimarox)	4.2.7

**Note**

The description and working principle of the sensors applies to the infeed/out-feed conveyor on the machine. When infeed or outfeed takes place at several levels, more sensors are required. Refer to the machine layout drawing.

4.2.1 Product infeed

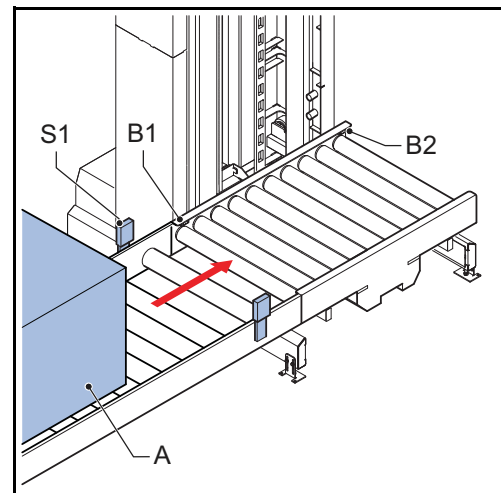
The used infeed time depends on:

- The dimensions of the products.
- The speed of the conveyors.

4.2.2 Preparing products for infeed to the machine

- S1 Count photocell S1 (not supplied with the PRORUNNER Mk9)
- B1 Left side of carrier clear / not clear
- B2 Right side of carrier clear / not clear
- A Product

The product is fed in onto the supply conveyor and monitored by sensor S1. The sensor is located on the end of the supply conveyor. The product (A) will wait at this position until the stop sensor gives a release signal to infeed the product to the machine (not in shown in this figure). Refer to sensors B5 or B7 as shown in illustration at the start of section 4.2. Products will only be supplied to the machine when this signal has been given.



If a product backup occurs, the release to the infeed signal must be stopped to make sure further products are not infeed to the machine. It is still possible to discharge products that are still in the machine.

4.2.3 Monitoring products supplied to the vertical conveyor

The machine can be configured as:

- infeed on lower position and outfeed on upper position
- infeed on upper position and infeed on lower position

On each side of the moveable conveyor a photocell is, or needs to be mounted. The lift can move after a product has been transported into the machine and both sensors are not active.

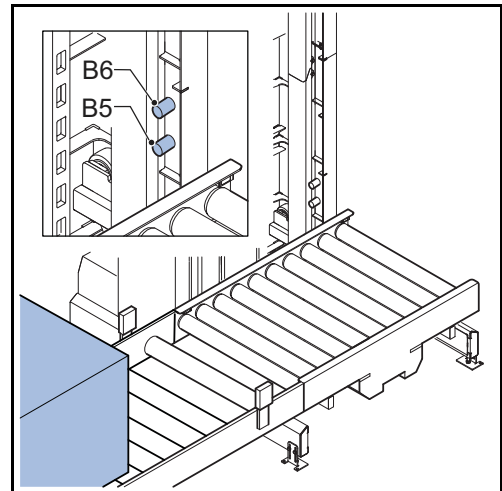
The transporter empty sensor monitors run-time. The run-time function checks to make sure a product does not take too long to move from the supply conveyor to the product transporter.

4.2.4 Reduce speed down sensor and stop transporter down sensor

- B5 Stop transporter down sensor
B6 Reduce speed down sensor

The reduce speed down sensor B6 is operated by the transporter of the machine. The stop transporter down sensor B5 stops the transporter so that it can receive products from the supply conveyor.

These sensors must be mounted to the machine frame. The sensors must be set so that they are activated when the transporter is just under or level with the supply conveyor.



4.2.5 Product infeed configurations

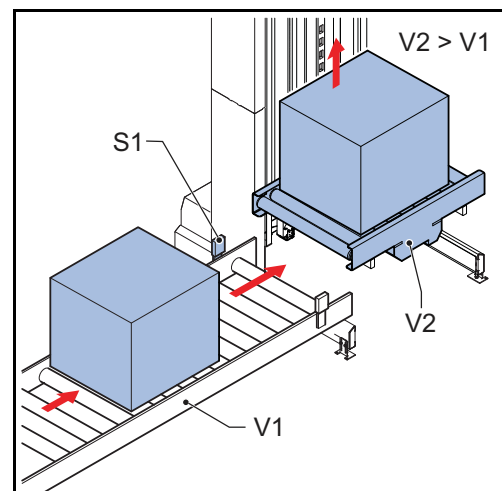
There are various product infeed configurations that can be used, including mirrored configuration setups. Below are some examples.



Note

In the configurations illustrated below, the count photocell S1 must be mounted so the opening between products can be detected.

Product infeed with 2 driven conveyors

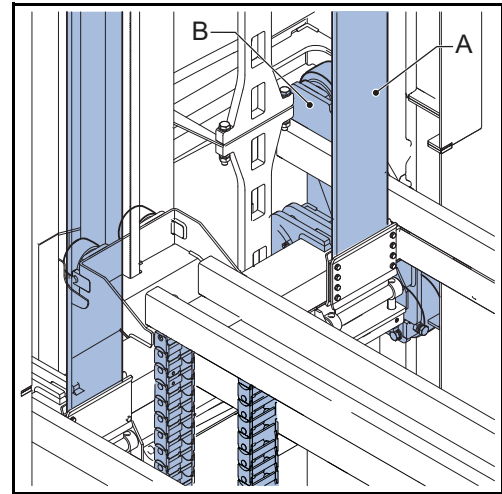


4.2.6 Product transportation

- A Flat belt
- B Trolley

The flat belt (A) is wound up and down and moves the trolley (B) with the transporter mounted on it vertically.

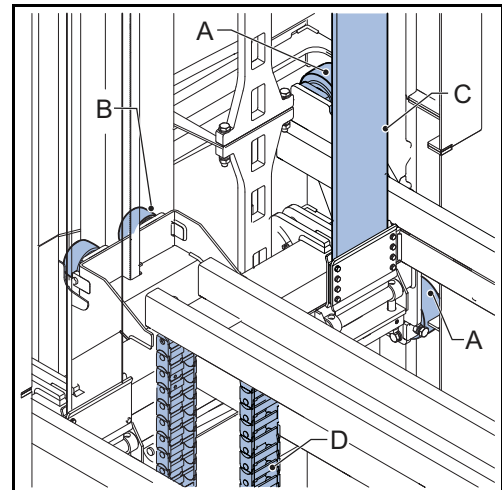
Because the infeed is discontinuous, buffering the product at the supply can be necessary in some cases. If this is not possible and stops of the infeed are undesired, the speed of the machine must be brought in line with the speed of the infeed with a frequency controller.



Keeping the trolley horizontal

- A Wheel
- B Stabilizer wheel
- C Flat belt
- D Cable track link

The trolley has been mounted to a flat belt (C) and moves vertically by winding the flat belt up and down. The flat belt is mounted with a clamping construction. The stabilizer wheels (B) keep the wheels (A) horizontally on both sides while these wheels carry the product load. The cable track link (D) guides the cables to and from the transporter.



4.2.7 Product outfeed

The entire product must be placed on the discharge conveyor before returning to infeed position.

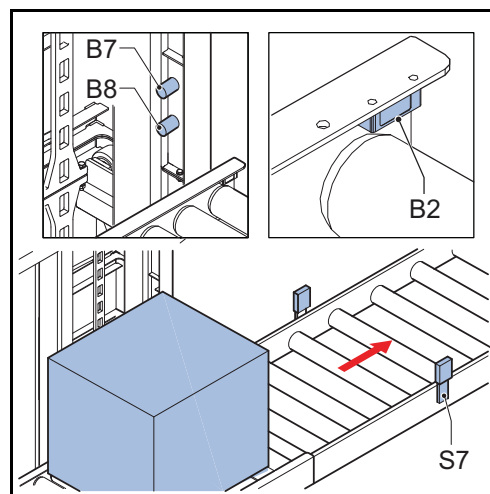
The available outfeed time depends on:

- The speed of the vertical movement.
- The dimensions of the transporter.
- The dimensions of the product.
- The speed of the conveyors.

Monitoring the discharge of products

- B8 Reduce speed up sensor
- B7 Stop transporter up sensor
- B2 Transporter empty sensor
- S7 Discharge empty sensor (not supplied with the PRORUNNER Mk9)

Sensors B8 and B7 are mounted in the machine. Sensor B8 slows down the vertical movement. Sensor B7 stops the vertical movement. When the movement has stopped and sensor S7 is free, the transport of the product is started. When sensor S7 is active and sensor B2 is free, the transport is stopped. The product transporter travels to the infeed position again.



4.3 Specifications

The information below and the machine layout drawing give specifications for the transportation of products.

4.3.1 Product transport specifications

Refer to the machine layout drawing for the product specifications that are applicable to your machine configuration.

Data concerning product type, dimensions, bottom sides and weights must always be verified with Qimarox. For example, mouldable products in bags will usually not be transported along rollers, but along belts.

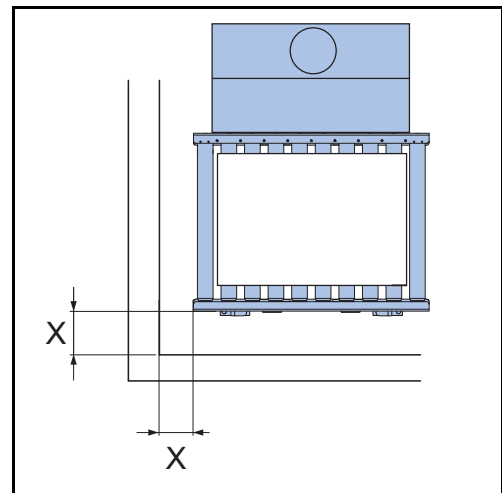
When permitted weight and distance deviate from the specifications in the machine layout drawing, the machine must be adjusted to accommodate this. These type of adjustments may only be carried out by Qimarox or after written permission from Qimarox has been obtained.

If Qimarox does not supply the product conveyor, the weight of the applied conveyor needs to be checked by Qimarox to determine the correct drive on the vertical movement..

4.3.2 Machine use specifications

Refer to the machine layout drawing for information for detailed information.

The minimum distance of the product on the product carrier and parts of conveyors, conveyor supports, signalling devices, etc., must be 100 mm.



4.3.3 Specifications of the surrounding area

The surrounding area of the machine must have the following properties:

Property	Description
General	Covered and normally clean for operation. There must be sufficient space around the machine for carrying out maintenance and other activities on the machine.
Relative air humidity	Maximum 80%.

Property	Description
Temperature	Between +5°C (41 F) and 40°C (104 F).
Floor	Even. The floor load is given in the machine layout drawing.
Required height	Refer to the machine layout drawing.

When the specifications for the surrounding area still deviate from the table above, the machine must be adjusted to this. Such adjustments shall always be carried out by Qimarox or after permission from Qimarox.

4.3.4 Electrical specifications

See the type plate. Refer to section 2.1 and the electrical circuit diagrams in chapter 12.

5 Application information

The machine layout drawing gives application information for the machine.

5.1 Layout options

The machine can be set up in different configurations to work with the layout of the infeed and outfeed conveyors.

This infeed and outfeed conveyor layout determines:

- The transport method for infeed and outfeed. Refer to section 5.3.3.
- The fenced area. Refer to section 5.2.

This chapter gives an overview of most possibilities and the required points of attention.

5.2 Fenced area

Qimarox obligates to protect the machine with a fenced area to avoid persons moving around the danger zone of the machine.

The fenced area must comply with EN ISO 13857 and EN 619 standards.

The infeed and outfeed openings of the machine must be designed such, that they protect persons against reaching the danger zone. When this is not possible, these openings must be provided with a so-called tunnel guard or blocking device. A tunnel guard must be designed in accordance with EN-ISO 13857:2008. A blocking device must be designed in accordance with EN-ISO 1088:1996.

Make sure that the fenced area complies with local law and rules for protection against danger. If the fenced area is fitted with a door, it must have a safety switch to shut down the system when opened. Refer to 5.3.2.

The maximum dimensions of the mesh of the fenced area is 40 x 40 mm (width x height).

If Qimarox supplies the safety fencing, the specifications will be included in the machine layout drawing.

5.3 Control

The control of the machine should be done from a central control system. Standard software blocks for Siemens are available at Qimarox.

The conditions for the control have been laid down in the technical specifications. When these conditions are not met, the emergency stop circuit of the machine must be activated.

5.3.1 Electrical components

This section describes the sensor and motor electrical components.

Sensors

If the sensors are part of the delivery, they will have been connected to a central terminal box with cables. The central terminal box offers possibilities for connecting several sensors with 3,4, or 5 pole connections.

Motor

The motor can be connected directly or through an operating switch in the main switch box. The machine must be controlled with a frequency converter to ensure a smooth start and stop movement.

The motor safety relays (Q1, Q2, and section 12) must meet EN-IEC 60204-1 specifications. The setting range depends on the motor specifications.

If a power controller controls the machine drive, the European EMC directives concerning the electrical system must be adhered to. For advice with respect to these installation activities, please contact the supplier of the power controller.

5.3.2 Safety controls

The provisions must be designed according to a so-called Performance Level (PL) corresponding with the current standard for safety functions of a machine or a machine control in compliance with EN ISO 13849-1:2008. To the machine a PL_d applies, in which d indicates that the risk must be substantially reduced.

Guard the access door with a safety switch

If the fenced area has an access door, it must be guarded with a safety switch (blocking device). When opening the door, this switch will activate the emergency stop and safety circuit and switch off the main power and the control current of the machine.

Emergency stop circuit

The machine must have an emergency stop circuit. When one of the emergency stop buttons is pressed, the main power and the control current of the machine are switched off immediately.

Set the motor protection relay

Motor protection devices must be set to the nominal motor current. A relay set too low prevents optimum use of the motor. A relay set too high does not guarantee full thermal protection.

When a correctly set relay trips too often, reduce the load of the motor or use a larger motor.

Thermistor protection (TF contact)

For motors that are frequently started and stopped, intermittently operated, use a high switching frequency or power controller, it is essential to use a motor protection relay and thermistor protection. This is to avoid prematurely switching the motor protection relay or overheating of the motor winding in these operational conditions.

Check continuously moving of products

It is necessary to check if the products are continuously moving during transport to the infeed and outfeed position by means of time monitoring in the software. When the time is exceeded, the machine must immediately stop to avoid damage.

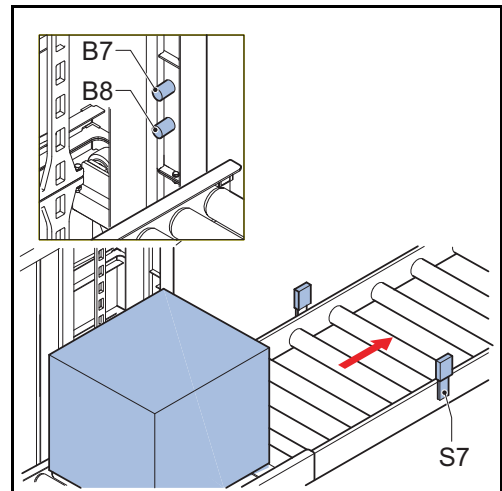
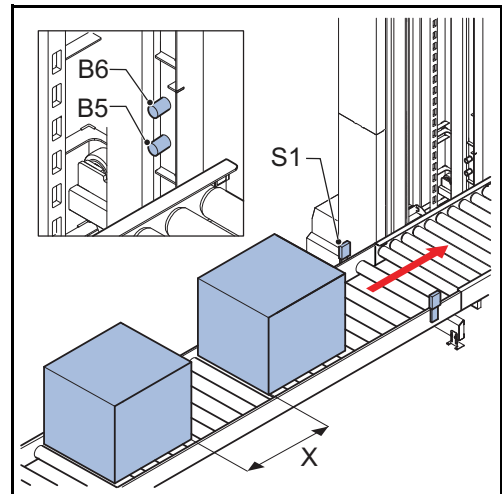
Drop-Down protection

The machine is equipped with a drop-down safety device which protects the carrier from falling down if lifting belts break or are being released. This device is installed for personal safety and can not be used as fall protection during operation.

5.3.3 Control advice

Important point about the software control of the machine:

- Make sure that the products are fed to the machine with a time interval (X) spaced between them. If products run into each other, sufficient space must be created between these products on the transition to the infeed conveyor.
- Make sure the all the photocells and sensors (see chapter 4.2) have been adjusted correctly to the product and the trolley. Inaccurate settings can result in machine malfunction.
- The product transported into the machine is controlled by the starting pulse from the sensor B5. The time that the product needs to run in after the starting pulse is to be determined by experience.
- The sensor S7 checks if the discharge conveyor has enough free space to receive the entire product. If not, the product run must not be started.
- The run time (the time the product needs to run in and out of the machine) must be monitored by the software. If this time is exceeded, the machine must stop immediately.
- The vertical movement of the machine must be monitored. This can be done by applying time monitoring to the passing of the transporter on the stop sensor B5 or B7. If this time is exceeded, the machine must stop immediately.



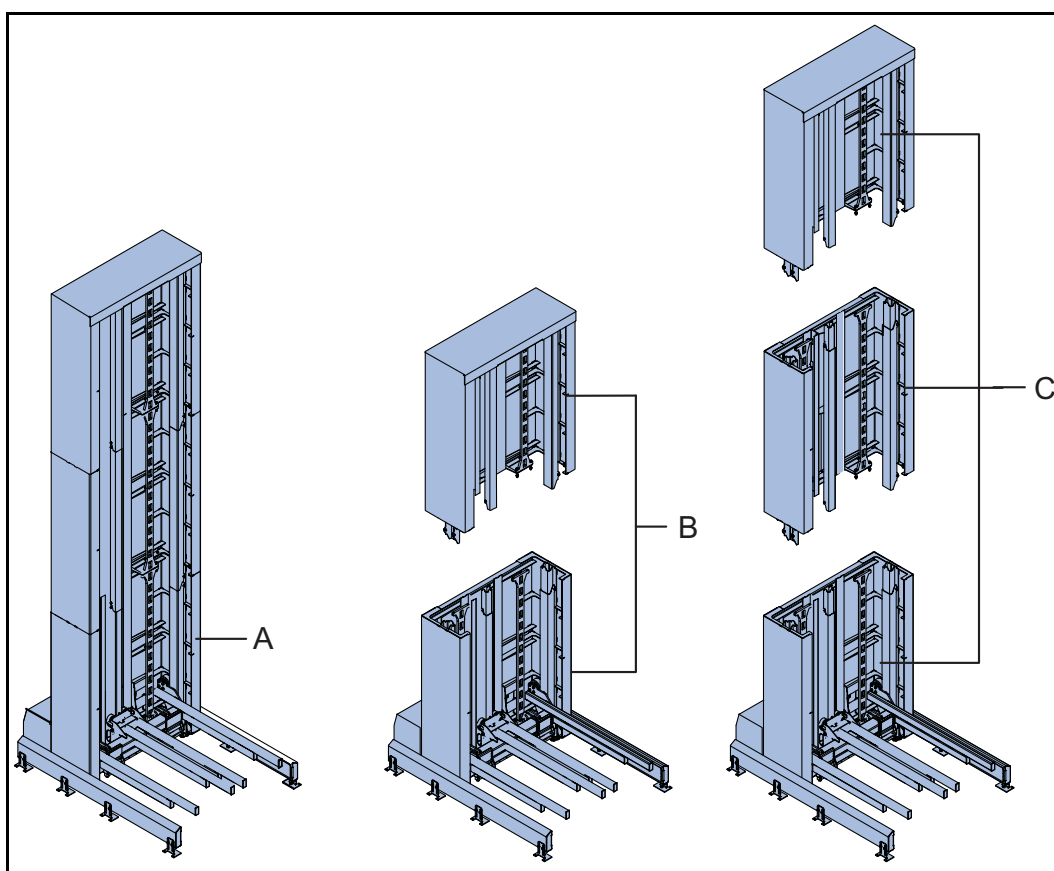
6 Installation

This chapter describes installation instructions. Refer to chapter 12 for machine assembly instructions.

6.1 Delivery

The machine can be delivered pre-assembled or in parts.

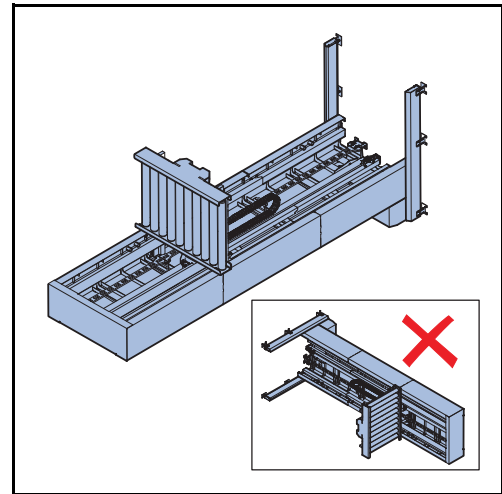
- A pre-assembled machine will be delivered in a horizontal position.
- For a machine delivered in parts, the column section is delivered in an upright position in a crate. Refer to chapter 12 for information on how to assemble the machine parts.



- A Machine pre-assembled
 B Machine in two parts
 C Machine in three or more parts

6.2 Transport

The machine must be placed in a horizontal position with the product conveyor facing upwards when fully assembled.

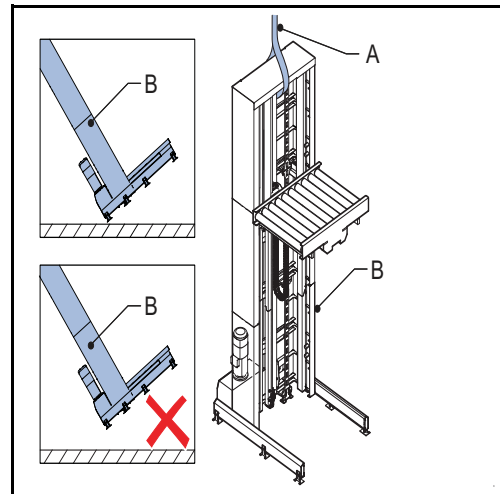


6.2.1 General preparation

1. Calculate the total weight before moving the machine.
 - The weight of the machine is given on the type plate. Refer to section 2.1.
 - Add to this, the weights of any attachments to the machine, for example, product conveyors. The weights are given on the type plates of the product conveyors.

6.2.2 Vertical transport

1. Check the type plate for the exact weight of the machine.
2. Use a suitable hoisting system that complies with local regulations.
3. Attach a suitable hoisting belt or hoisting chain (A) to the top cover of the machine.
4. If necessary, put the machine in the vertical position. Make sure that the machine does not tip over after it has been put in the vertical position.
5. Make sure that the bottom side of the machine (B) is not dragged along the ground during transport.



6.3 Unpacking

1. Check the packing list when unpacking the machine.
2. Immediately report damage or missing parts to Qimarox.

6.4 Preparations for a Qimarox installation (optional)

The preparations given below will need to be done before Qimarox can assemble the machine on site. All equipment listed below must be present before and during assembly.

1. Indicate the contact person to whom the engineer of Qimarox must report when arriving or leaving before and after the assembly. This only applies when Qimarox takes care of the assembly.
2. Make sure that the engineer of Qimarox is assisted by two qualified engineers of the client. Refer to section 3.
3. Make sure that the place where the assembly takes place:
 - is accessible, has sufficient light and is at room temperature.
 - has been laid out such, that the engineers can work quietly and safely there.
 - is suitable for drilling and/or grinding, if necessary.
4. Provide hoisting equipment:
 - preferably a bridge crane, minimum carrying capacity 1.5 x the weight of the machine.
 - or a fork-lift truck combined with a hoist with a minimum capacity of 2 x the weight of the machine at a lifting height with a minimum height of the machine plus 2 meters.
5. Provide electric power (230 V AC) at a maximum of 5 metres from the place of assembly of the machine.
6. Provide the correct safety provisions:
 - Moveable scaffolding or a hydraulic hoist.
 - Personal protection equipment.

6.5 Installing the machine



WARNING

- The machine may only be set up by qualified personnel. Refer to section 3.
- Machines higher than 4 metres must be laterally supported in order to get sufficient stability in the lift column. Refer to the machine layout drawing.

6.5.1 Preparation

1. Make sure that a hoisting system above the machine is available. Refer to section 6.2.2.
2. Make sure that the surface is level and meets the requirements for carrying the total weight of the transport system. Refer to the machine layout drawing.
3. Keep the rear side of the machine, especially the top of the drive, accessible for service. Maintain a free space of approximately 800 mm.

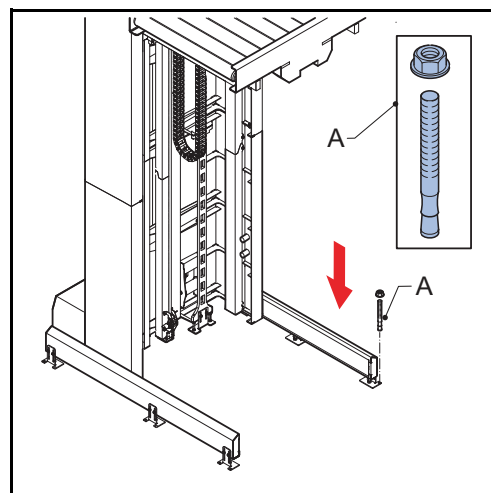
6.5.2 Installing a pre-assembled machine

1. Position the machine using a hoisting system. Refer to section 6.2.2.
2. Check if the machine is completely level.
3. Anchor the machine (A).

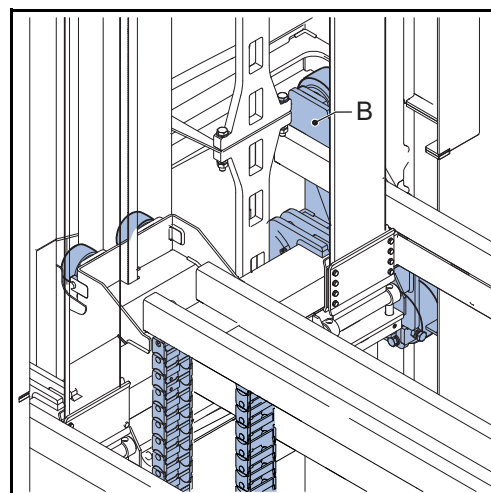


Note

Use Fischer FBN II 12/100 bolts or equival. These bolts are not delivered by Qimarox. See for the specifications of the bolts the information of the supplier.

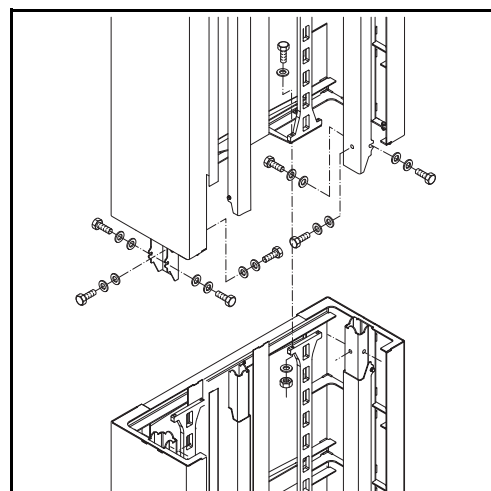


4. Check if drop-down safety system is working correctly and if safety pins are released.
5. Check if the trolley (B) can run freely.

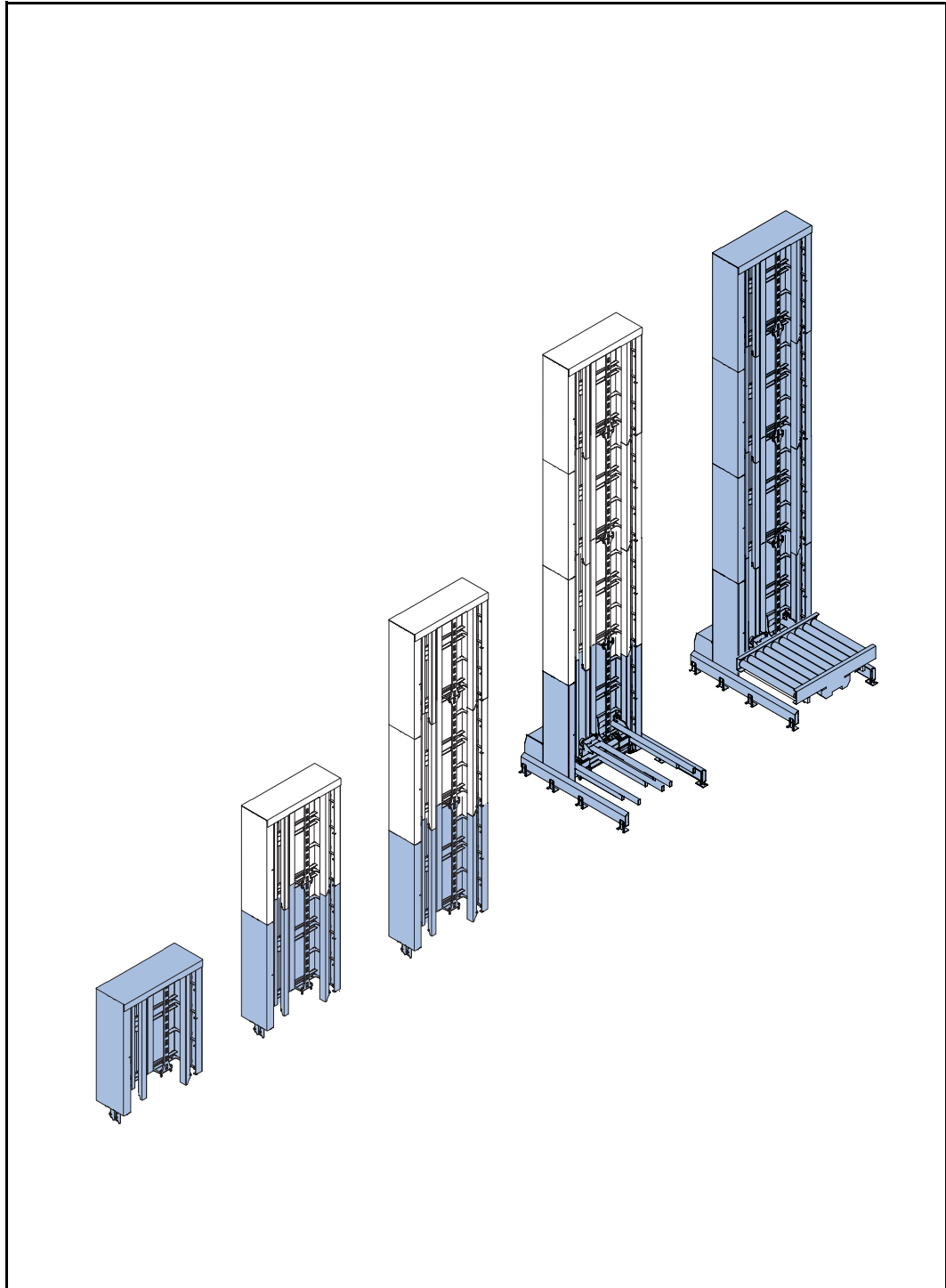


6.5.3 Installing a machine delivered in parts

1. Mount the parts. Place the frames that need to be connected on top of each other and connect them by placing the bolts and nuts and tighten them correctly.
2. Set up the machine. Refer to section 6.5.2.
3. The machine can be installed from top to bottom (see 6.5.4) or from bottom to top (see 6.5.5).

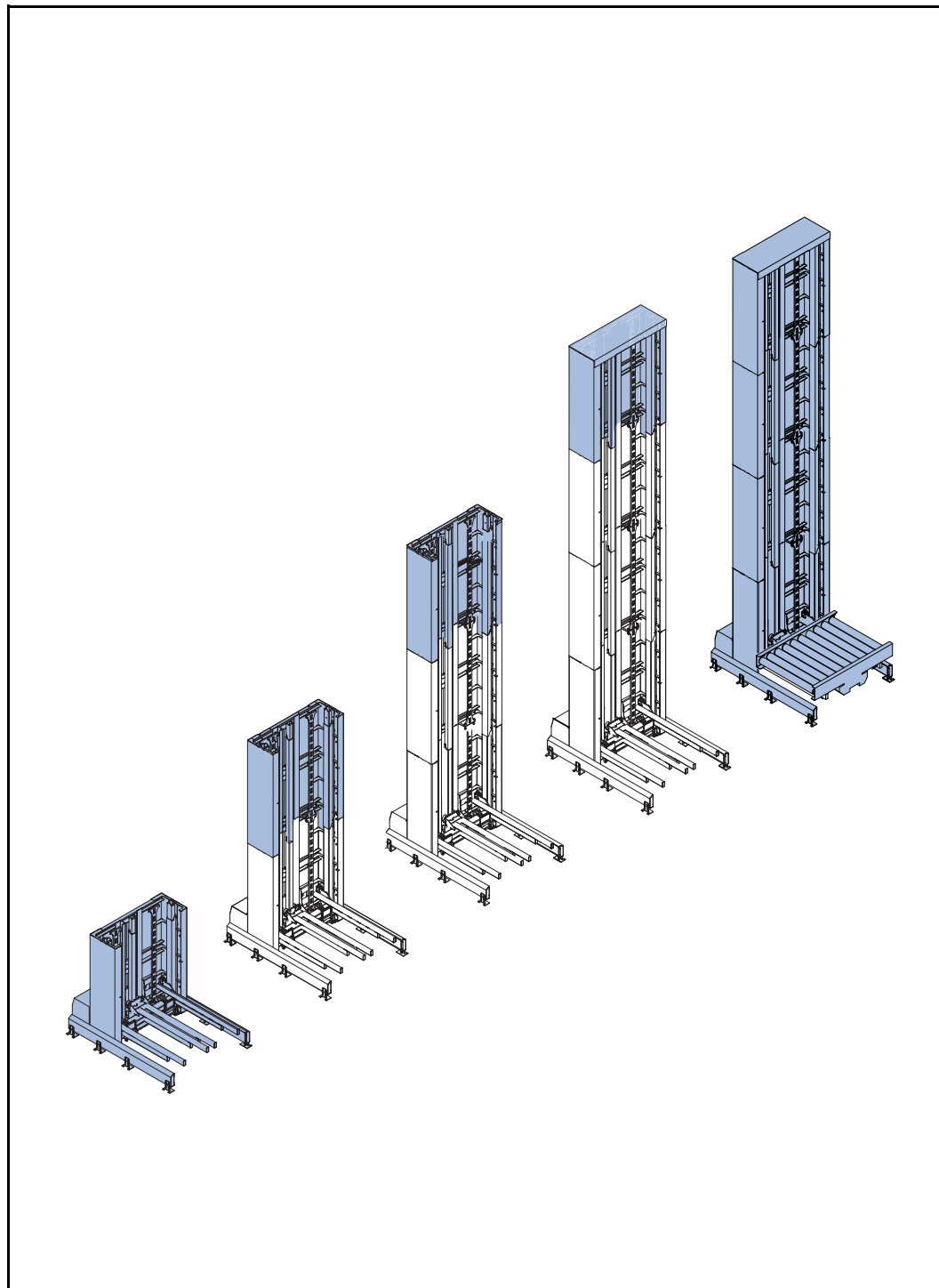


6.5.4 Installing a machine from top to bottom



1. Hoist up top section.
2. Mount next section below top section.
3. Hoist up and mount next section.
4. Repeat step 3 until bottom section has been mounted.
5. Mount the flat belt on the carrier.
6. Mount moveable and fixed conveyors.

6.5.5 Installing a machine from bottom to top



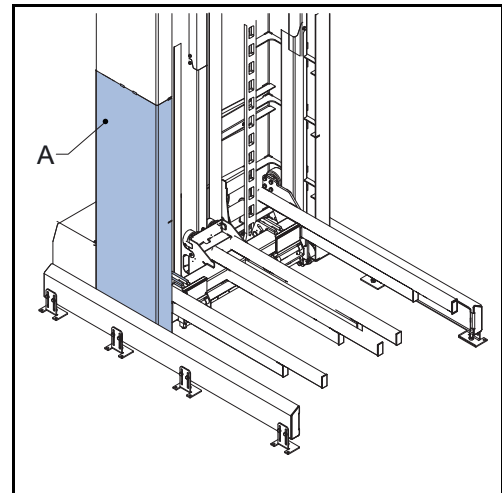
1. Place bottom section.
2. Place next sections on top until top section has been placed.
3. Mount the flat belt on the carrier.
4. Mount moveable and fixed conveyors.

6.6 Installing the supply conveyor



WARNING

Do not drill any extra cable holes in the shaded part (A) with a diameter larger than 8 mm, unless they are sealed again before use. This is important to make sure there is no risk of body parts becoming jammed in the machine. Always observe national and local legislation and regulations with regard to health and safety.



7 Maintenance vertical conveyor



CAUTION

- The maintenance as described in this chapter is based on 2000 running hours per year. Adjust the maintenance frequency to the actual number of running hours per year.
- If required, Qimarox can carry out the maintenance activities.

7.1 Specific safety regulations

For optimum functioning of the machine the various machine parts must be regularly maintained. In this way defects and inaccuracies of the machine are prevented.



WARNING

- Only a qualified maintenance engineer is allowed to carry out maintenance activities on the machine. Refer to section 3.2.
- Take the power off the machine using the main switch before starting any maintenance or repair activities. Secure the main switch with a padlock.
- Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC. Read the instructions on the packaging when use is made of chemical substances (cleaning agents).
- After having completed maintenance activities, always put all safety provisions that have been removed in place again.
- Make sure that the machine has always run empty before carrying out any activities. No products may be present in the machine.
- Take the appropriate measures for safely working at heights.



CAUTION

Avoid parts made of rubber or plastic, such as cables and gaskets, making contact with oil, solvents or other chemicals.

7.2 Preventive maintenance schedule, machine excluding the transporter

7.2.1 Daily maintenance

Item	Task	Action when required by the check
Guards	Check for visible damage.	Replace damaged guards.
	Check if the mounting materials are present and have been correctly placed.	Place the mounting materials or correct the way in which they have been fastened.
The entire machine	Check for visible dirt.	Clean the machine.

7.2.2 Weekly maintenance

Item	Task	Action when required by the check
Wheels of the trolley	Check for visible damage of the running surface and bearings.	Replace the wheels.
	Clean. Refer to section 7.3.	
	Check for running sounds.	Lubricate the wheels of the trolley.
Flat belt	Check for wear and tear.	Replace the flat belt.
Flexible cable channel	Check for damaged links	Replace the damaged links.
Cabling	Check the cables for visible damage	Replace the cable(s).

7.2.3 Monthly maintenance

Item	Task	Action when required by the check
Motor reductor Follow the instructions in the manual of the manufacturer of the motor reductor.	Check the seals for leakage.	Replace the seals.
	Check for visible damage.	Replace the damaged parts.
	Check for running sounds.	Replace the motor reductor.
Shaft of trolley	Check for visible damage.	Replace the trolley.
Bearings of the wheels of the trolley	Check for play.	Replace the wheels.
Photocells	Check for visible damage.	Replace the photocell if necessary.
	Check for loose parts.	Fasten loose parts.
	Clean. Refer to section 7.3.	

Item	Task	Action when required by the check
Inductive sensors	Check for visible damage.	Replace the switch if necessary.
	Check for loose parts.	Fasten loose parts.
	Clean. Refer to section 7.3.	
Cabling	Check if all cables are fastened tightly.	Connect the cables again if necessary.
Adjusting rings	Check if the adjusting rings are fastened tightly and look for visible damage.	Replace the adjusting ring.

7.2.4 6-monthly maintenance

Item	Task	Action when required by the check
Motor reductor Follow the instructions in the manual of the manufacturer of the motor reductor.	Check the oil level.	Refill the oil.
	Check the oil for contamination.	Change the oil.
	Check the air gap of the brake.	Adjust the air gap.
All bolt connections	Check all bolt connections.	Tighten bolts using the correct tool and torque.

7.2.5 2-yearly maintenance or after 10,000 running hours, whichever comes first

Item	Task	Action when required by the check
Motor reductor Follow the instructions in the manual of the manufacturer of the motor reductor.	Change the oil.	

7.3 Cleaning



WARNING

Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC. Read the instructions on the packaging when use is made of chemical substances (cleaning agents).



CAUTION

- Electrical components should not make contact with water or other liquids.
- Do not clean the machine with compressed air or water under high pressure.
- Avoid parts made of rubber or plastic, such as cables and gaskets, from making contact with oil, solvents or other chemicals.

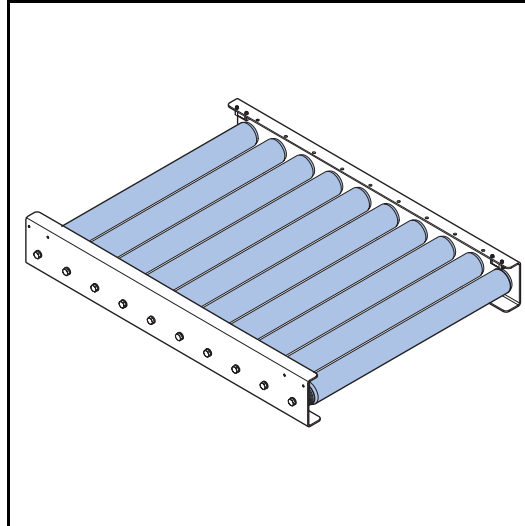
1. Switch off the machine.
2. Secure the main power supply switch with a padlock.
3. Remove deposit and dirt by hand.
4. Report any damage to the technically responsible person or to Qimarox and make sure that any damage is remedied before restarting the machine.

7.4 Lubrication

7.4.1 Trolley wheels

1. Lubricate the running surfaces of the wheels with Bel-Ray No-Tox HD Grease (62270, 62280) or equivalent.

8 Maintenance Roller conveyor



CAUTION

- The maintenance as described in this chapter is based on 2000 running hours per year. Adjust the maintenance frequency to the actual number of running hours per year.
- If required, Qimarox can carry out the maintenance activities.

8.1 Specific safety regulations

For optimum functioning of the machine the various machine parts must be regularly maintained. In this way defects and inaccuracies of the machine are prevented.



WARNING

- Only a qualified maintenance engineer is allowed to carry out maintenance activities on the machine. Refer to section 3.2.
- Take the power off the machine using the main switch before starting any maintenance or repair activities. Secure the main switch with a padlock.
- Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC. Read the instructions on the packaging when use is made of chemical substances (cleaning agents).
- After having completed maintenance activities, always put all safety provisions that have been removed in place again.
- Make sure that the machine has always run empty before carrying out any activities. No products may be present in the machine.
- Take the appropriate measures for safely working at heights.



CAUTION

Avoid parts made of rubber or plastic, such as cables and gaskets, making contact with oil, solvents or other chemicals.

8.2 Preventive maintenance schedule, Roller conveyor

8.2.1 Daily maintenance

Item	Task	Action when required by the check
Guards and covers	Check for visible damage.	Replace damaged guards and / or covers.
	Check if the mounting materials are present and have been correctly placed.	Place the mounting materials or correct the way in which they have been fastened.
Entire machine	Check for visible dirt.	Clean the machine. Refer to section 8.3.

8.2.2 Weekly maintenance

Item	Task	Action when required by the check
Rollers	Check for visible damage to the surface and sides.	Replace damaged rollers.
	Clean. Refer to section 8.3.	
	Make sure the rollers run freely and smoothly.	Replace the roller.
	Check the Poly-V drive head for damage.	Replace the roller.
	Check for running sounds.	Replace the roller.
Motor reductor. Refer to section 7.2.	Check for damage on the running surface.	Replace the drive roller.
	Clean. Refer to section 8.3.	
	Check the Poly-V drive head for damage.	Replace the drive roller.
	Check for running sounds.	Replace the drive roller.
Chain	Check for damage.	Replace damaged chain.
	Clean. Refer to section 8.3.	
	Check for visible deformation.	Replace the chain.

8.2.3 Monthly maintenance

Item	Task	Action when required by the check
Photocells	Check for visible damage.	Replace the photocell and the reflector if necessary. Refer to section 8.7.
	Check for loose parts.	Fasten loose parts.
	Clean. Refer to section 8.3.	
Cabling	Make sure that all cables are securely fastened.	Connect the cables again if necessary.

8.2.4 6-monthly maintenance

Item	Task	Action when required by the check
All bolt connections	Check all bolt connections.	Tighten bolts using the correct tool and torque.

8.2.5 2-yearly maintenance¹

Item	Task	Action when required by the check
Drive roller Refer to section 7.2	Replace the drive roller.	

¹ Or after 10,000 running hours, whichever comes first.

8.3 Cleaning



WARNING

Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC. Read the instructions on the packaging when use is made of chemical substances (cleaning agents).



CAUTION

- Electrical components should not make contact with water or other liquids.
- Do not clean the machine with compressed air or water under high pressure.
- Avoid parts made of rubber or plastic, such as cables and gaskets, from making contact with oil, solvents or other chemicals.

1. Switch off the machine.
2. Secure the main power supply switch with a padlock.
3. Remove deposit and dirt by hand.
4. Report any damage to the technically responsible person or to Qimarox and make sure that any damage is remedied before restarting the machine.

8.4 Check the drive roller

1. Replace the drive roller if it is damaged or making running sounds.

8.5 Check the rollers

1. Replace the roller if it is damaged or making running sounds.

8.6 Check the belts

The belts will elongate with use. How fast this will happen will depend on the conditions of use. Belts elongate most after the machine has been put into operation for the first time. A belt with insufficient tension will slip and may not convey the product properly. Slipping belts must be replaced.

8.7 Replace parts

Some machine parts are subject to wear. See the type plate and the exploded view for the specifications of the machine parts.



CAUTION

Replace parts only with parts supplied or recommended by Qimarox. If parts are not replaced with supplied or recommended Qimarox parts, the machine guarantee will become null and void.

9 Troubleshooting

9.1 Vertical conveyor

Problem	Possible cause	Solution
The motor does not run.	Electrical failure.	Remedy the electrical failure.
	The operation or main switch is on "OFF".	Set the operation/main switch to "ON".
	The door switch or emergency stop is active.	Release the emergency stop switch after having checked if the situation is safe.
The motor does not run and makes a humming sound.	Mechanical or electrical failure.	An authorised qualified person should disconnect the motor. Refer to section 3.2.
	No full power.	Check the power cable for a break or short circuit.
	Poor contact.	Check the terminal clamps.
	Defect in the motor.	Check the connection and the motor winding.
	Blown fuse.	Replace the fuse.
	Thermal safeguard triggered.	Investigate and remedy the cause of the heating.
	Motor protection triggered by short circuit or overload.	Investigate and remedy the cause. Then reset the motor protection.
	Defective power controller.	Investigate and remedy the cause. Replace the power controller.
The motor starts with difficulty.	Electrical faults such as "The motor does not run and makes a humming sound".	Check the starting current and the nominal current. Investigate and remedy the cause of the increased use of energy.
The motor is overheated.	The motor was designed for a star connection but has been connected in a triangle.	Change the connection from triangle into star.
	Voltage and/or frequency deviates from the nominal value when switching on.	Connect the motor according to the data on the type plate.
	The supply voltage deviates more than 5% from the nominal motor voltage.	Find out why it deviates and try to remedy this.
	Insufficient motor cooling.	Check the ventilation openings in the motor housing for blockage. Check the fan for damage.

Problem	Possible cause	Solution
The motor gets overheated and runs at a low speed.	Loose contact or broken cable in the power circuit of the motor.	Check the power circuit for loose contacts or broken cables.
	Too high use of energy.	Check the weight of the product according to the data on the type plate. Check the motor on easily free movement.
The motor hums and does not run properly.	The motor runs with 2 phases, e.g. because of a faulty connection, broken cable or a defective winding.	Check the connections and the cable. Dismount the motor for repair.
The fuses blow and/or the motor protection is triggered.	The power has been incorrectly connected.	Connect the power in the correct way.
	Short circuit in the power.	Remedy the short circuit.
	Wrong fuse (too low value).	Adjust the fuse to the nominal motor current.
	Motor protection poorly set.	Adjust the motor protection to the nominal motor current.
	Short circuit in the winding or with respect to the earth.	Dismount the motor for repair.
The motor does not run. The motor protection is triggered immediately.	Incorrect setting of the motor protection.	Check and/or adjust the motor protection to the correct value.
	The mechanical drive (chains, belts, rollers or guides) are blocked.	Remove the blockage. Clean the machine. If possible, shorten the inspection/maintenance/cleaning intervals. Check the chains, drive belts, rollers, guides and the like for damage or incorrect adjustment.
The motor does not run.	The operation or main switch is on "OFF".	Set the operation/main switch to "ON".
	The door switch or emergency stop is active.	Make sure that the situation is safe. Then release the emergency stop or the switch.
Use of energy (motor current) too high and higher motor temperature.	The weight of the products is too much.	Make sure the specifications for use of the machine have been observed.
Use of energy (motor current) too high	The drive belt does not run in line.	Align the drive belt.
Use of energy (motor current) too high and high temperature of the bearing housing (sometimes accompanied by sound).	Ball bearing, ball bush, return roller or the like is blocked.	Check the ball bearing, ball bush, return roller or the like and replace if necessary.

Problem	Possible cause	Solution
Abnormal sounds, unusual vibrations and swinging movements.	Drive system clogged by dirt.	Check the movement of the chain or drive belt and remove dirt or deposit. Shorten the cleaning interval.
	Guides or return wheels are dirty or damaged.	Check guides, chains and return wheels for damage or dirt. Replace or clean them as necessary.
Increased temperature of the bearing blocks. The return wheels turn with difficulty.	Damaged bearing blocks or return wheels.	Investigate and remedy the cause. Reset the motor protection.
	Transport speed too high.	Investigate and remedy the cause. Reset the motor protection.
	Loose bolt connections.	Investigate and remedy the cause. Reset the motor protection.
	Other machine parts run loose.	Investigate and remedy the cause. Reset the motor protection.

10 CE declaration of conformity

10.1 CE declaration of conformity

EC Declaration of Conformity of the Machinery in accordance with Directive 2006/42/EC, Annex II, point 1.A (Original Declaration)

Qimarox B.V.
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Fax : +31 (0) 341 436 701
Email : info@qimarox.com

hereby declares that the undersigned
is authorised to act on its behalf to compile
this Technical Dossier for this machine,
and also declares that the machine:

Name: **PRORUNNER mk9**
Function: Vertical transport
Model/Type: mk9
Method of construction: according to layout drawing
Date of construction: 2015
Serial number: mk9 XXXXXXXX



complies with all applicable provisions of the following Directive(s):

Directive 2006/42/EC (Machinery Directive)
Directive 2006/95/EC (Low Voltage Directive)
Directive 2004/108/EC (EMC Directive)

Where applicable, the following harmonised standards are used:

NEN-EN-ISO 12100:2010 (Safety of machinery)
NEN-EN-IEC 60204-1 (Electrical safety of machinery)
NEN-EN 619:2010 (Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of unit loads)

City: Harderwijk
Date: January 2015
Name: P.G. Hannessen
Function: Director

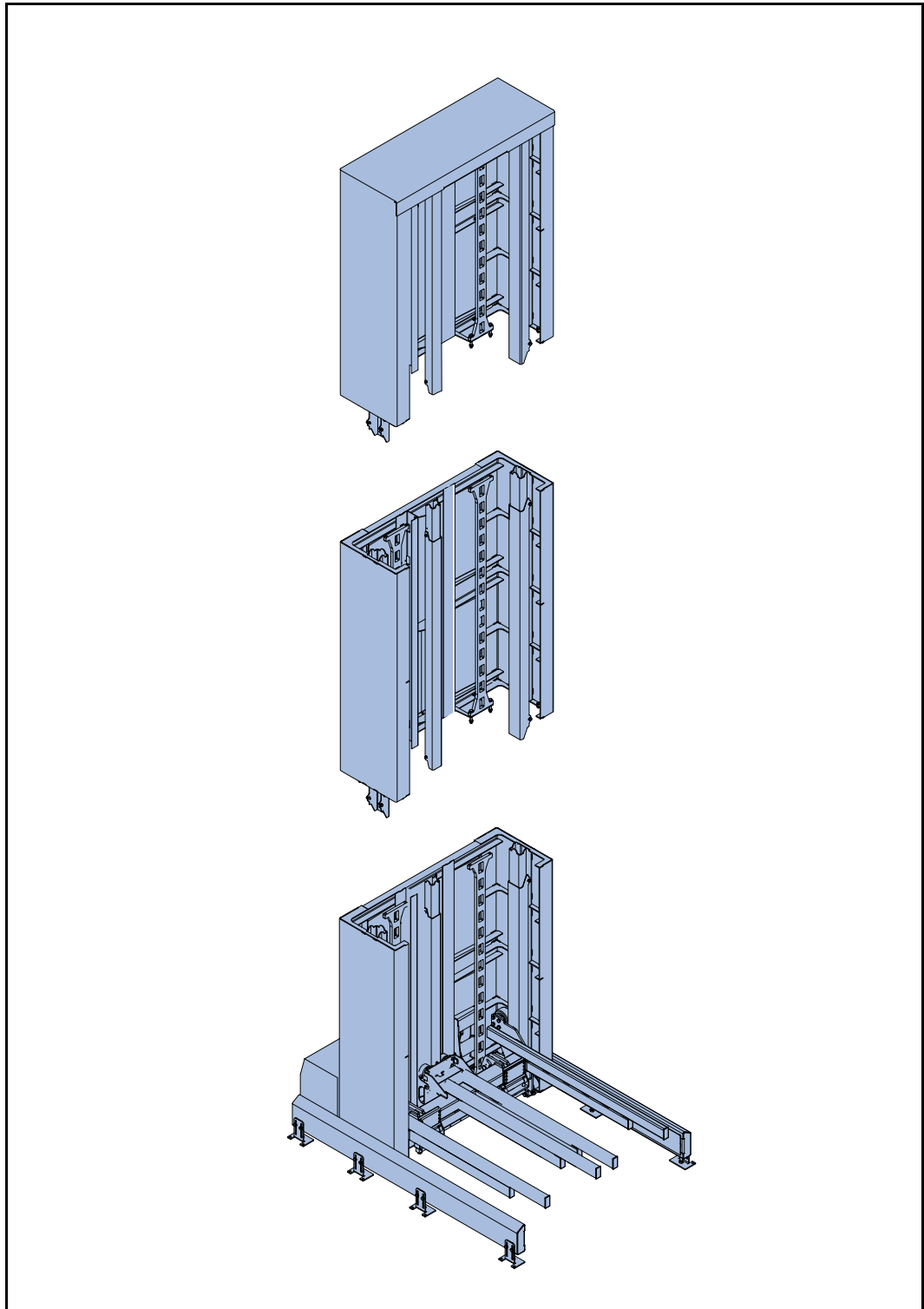
Signature:



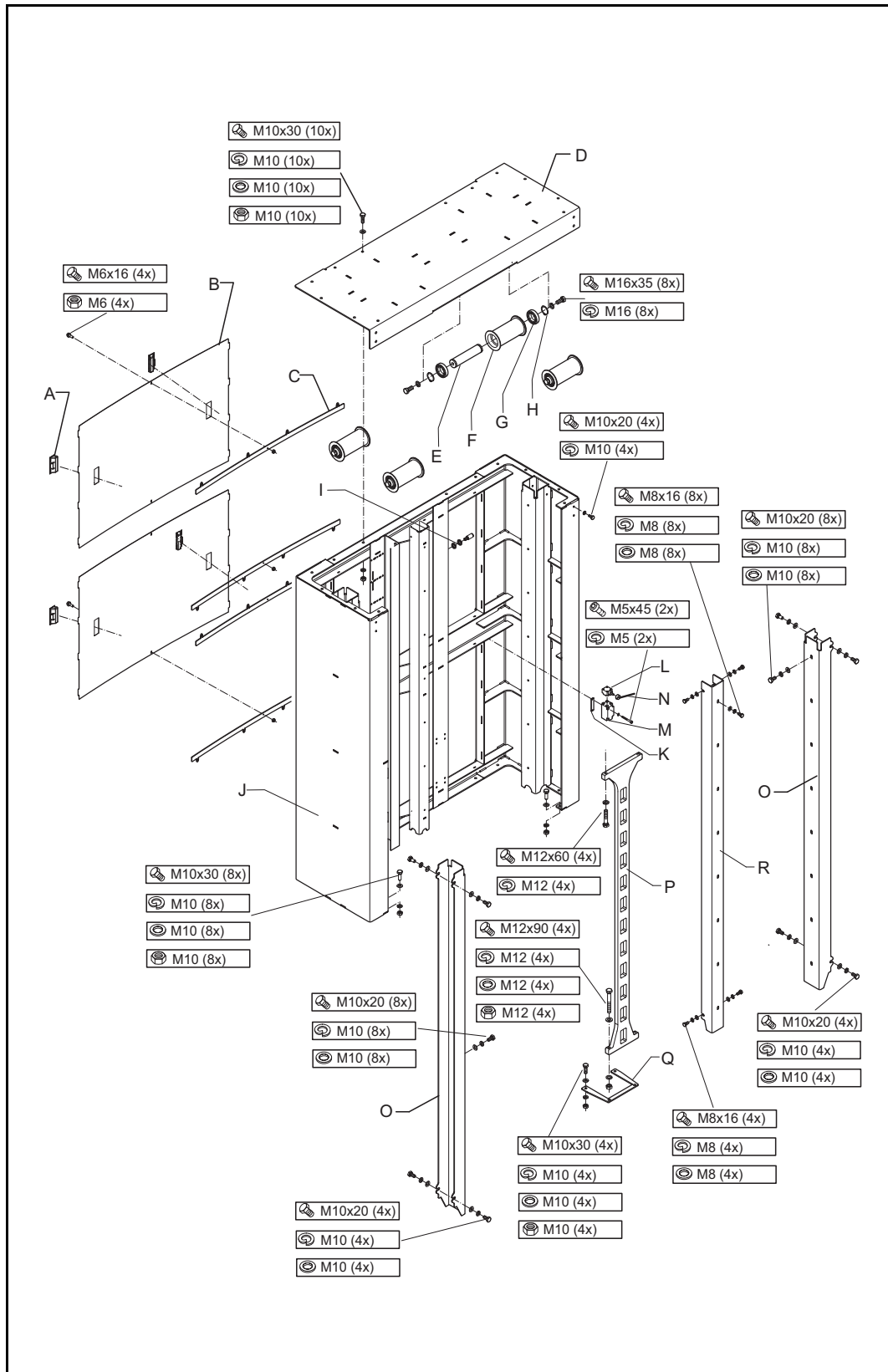
11 Exploded views

11.1 Frame parts

The following pages show exploded views of the frame parts and include part list and attachment materials information.



11.1.1 Top section exploded view



Top section parts list

Top section - parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	4	1000742	Pull handle	TS = 0.8 - 1.2 mm
B	2	AE000069302	Back shielding PRmk9	H = 573
	2	AE000069303	Back shielding PRmk9	H = 698
	2	AE000069304	Back shielding PRmk9	H = 823
C	4	AE0000695	Mounting strip shielding PRmk9	
D	1	AE0000664	End plate top sectionPRmk9	
E	1	AE0000583	shaft idler belt PRmk9	
F	4	AE0000582	Idler belt PRmk9	
G	8	1003534	Ball bearing	6008 - 2RS
H	8	1002372	Circlip ring	A40 1.75
I	2	1000932	Sensor	IME 18-08BPSZC0K
J	1	AE0000505	top section	H = 1475
	1	AE0000517	top section	H = 1725
	1	AE0000518	top section	H = 1975
K	1	AE0000713	Threaded plate	2 x M5
L	1	1001532	Limit switch head	
M	1	1001531	Limit switch body	
N	1	1001533	Limit switch lever	
O	2	AE000067901	Running surface top	H = 1475
	2	AE000067902	Running surface top	H = 1725
	2	AE000067903	Running surface top	H = 1975
P	2	AE000066801	Strip fall protection	H = 1475
	2	AE000066802	Strip fall protection	H = 1725
	2	AE000066803	Strip fall protection	H = 1975
Q	2	AE0000690	Plate fall protection	
R	2	AE000067301	Running surface top	H = 1475
	2	AE000067302	Running surface top	H = 1725
	2	AE000067303	Running surface top	H = 1975

Top section attachment materials

Top section - attachment materials			
Quantity	Item number	Description (parts)	Notes
22	1000125	Hex nut	M10
46	1000147	Plain washer	M10
12	1000149	Plain washer	M8
4	1000150	Plain washer	M12
50	1000172	Spring lock washer sq ends	M10
8	1000173	Spring lock washer sq ends	M12
28	1000193	Hex head bolt	M10 x 20
22	1000195	Hex head bolt	M10 x 30
12	1000209	Hex head bolt	M8 x 16
2	1000275	Hex socket head screw	M5 x 45
2	1000396	Spring lock washer sq ends	M5
12	1000398	Spring lock washer sq ends	M8
8	1000883	Spring lock washer sq ends	M16
4	1000973	Prev torque type hex nut	M6
4	1001324	Hex head bolt	M12 x 60
4	1001325	Hex nut	M12
8	1003512	Hex head bolt	M16 x 35
4	1003918	Hex bolt	M6 x 16
4	1005520	Hex bolt	M12 x 90

This diagram illustrates the exploded view of a metal cabinet assembly, showing the relationship between various components and the fasteners used to secure them. The components are labeled with letters A through Q, and the fasteners are specified by their size and quantity.

Fastener Legend:

- M6x16 (4x)
- M6 (4x)
- M10x30 (8x)
- M10 (8x)
- M10 (8x)
- M10 (8x)
- M10x20 (7x)
- M10 (7x)
- M10 (7x)
- M10x20 (4x)
- M10 (4x)
- M10 (4x)
- M10x30 (4x)
- M10 (4x)
- M10 (4x)
- M10 (4x)
- M12x90 (4x)
- M12 (4x)
- M12 (4x)
- M12 (4x)
- M8x16 (7x)
- M8 (7x)
- M8 (7x)
- M10x20 (7x)
- M10 (7x)
- M10 (7x)
- M8x16 (4x)
- M8 (4x)
- M8 (4x)

Component Labels:

- A: Cabinet door
- B: Cabinet top
- C: Cabinet side panel
- J: Cabinet main body
- O: Vertical support rail
- P: Horizontal support rail
- Q: Corner bracket
- R: Vertical support rail

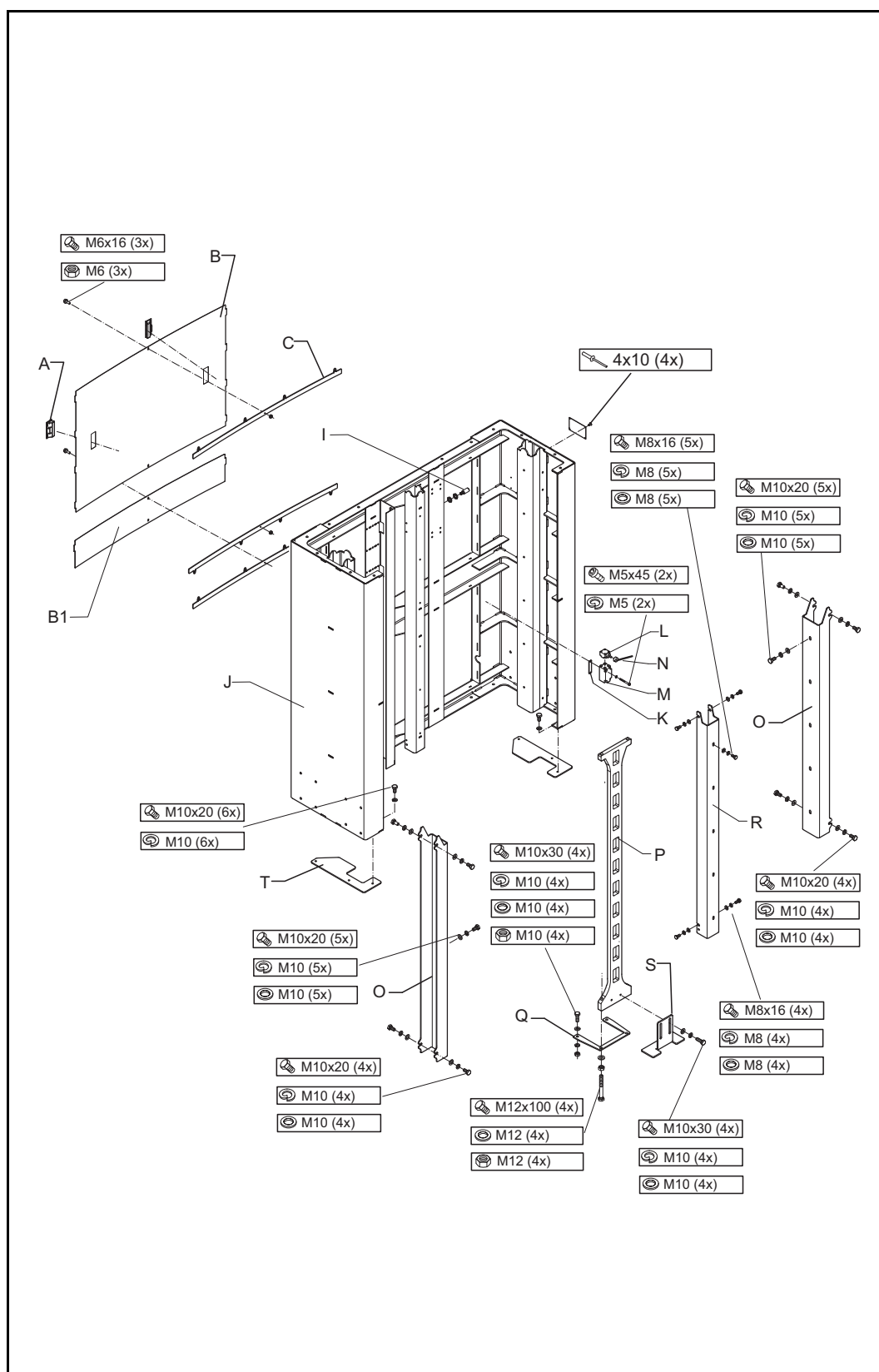
Mid section parts list

Mid section - parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	4	1000742	Pull handle	TS = 0.8 - 1.2 mm
B	2	AE000069301	Back shielding	H = 448
	2	AE000069303	Back shielding	H = 698
J	1	AE0000520	Mid section	H = 1250
	1	AE0000529	Mid section	H = 1750
O	2	AE000068201	Running surface mid	H = 1250
	2	AE000068202	Running surface mid	H = 1750
P	2	AE000067001	Strip fall protection	H = 1250
	2	AE000067002	Strip fall protection	H = 1750
Q	2	AE0000690	Plate fall protection	
R	2	AE000067701	Running surface mid	H = 1250
	2	AE000067702	Running surface mid	H = 1750

Mid section attachment materials

Mid section - attachment materials			
Quantity	Item number	Description (parts)	Notes
12	1000125	Hex nut	M10
34	1000147	Plain washer	M10
11	1000149	Plain washer	M8
4	1000150	Plain washer	M12
34	1000172	Spring lock washer sq ends	M10
4	1000173	Spring lock washer sq ends	M12
22	1000193	Hex head bolt	M10 x 20
12	1000195	Hex head bolt	M10 x 30
11	1000209	Hex head bolt	M8 x 16
11	1000398	Spring lock washer sq ends	M8
4	1000973	Prev torque type hex nut	M6
4	1001325	Hex nut	M12
4	1003918	Hex bolt	M16 x 16
4	1005520	Hex bolt	M12 x 90

11.1.3 Bottom section exploded view

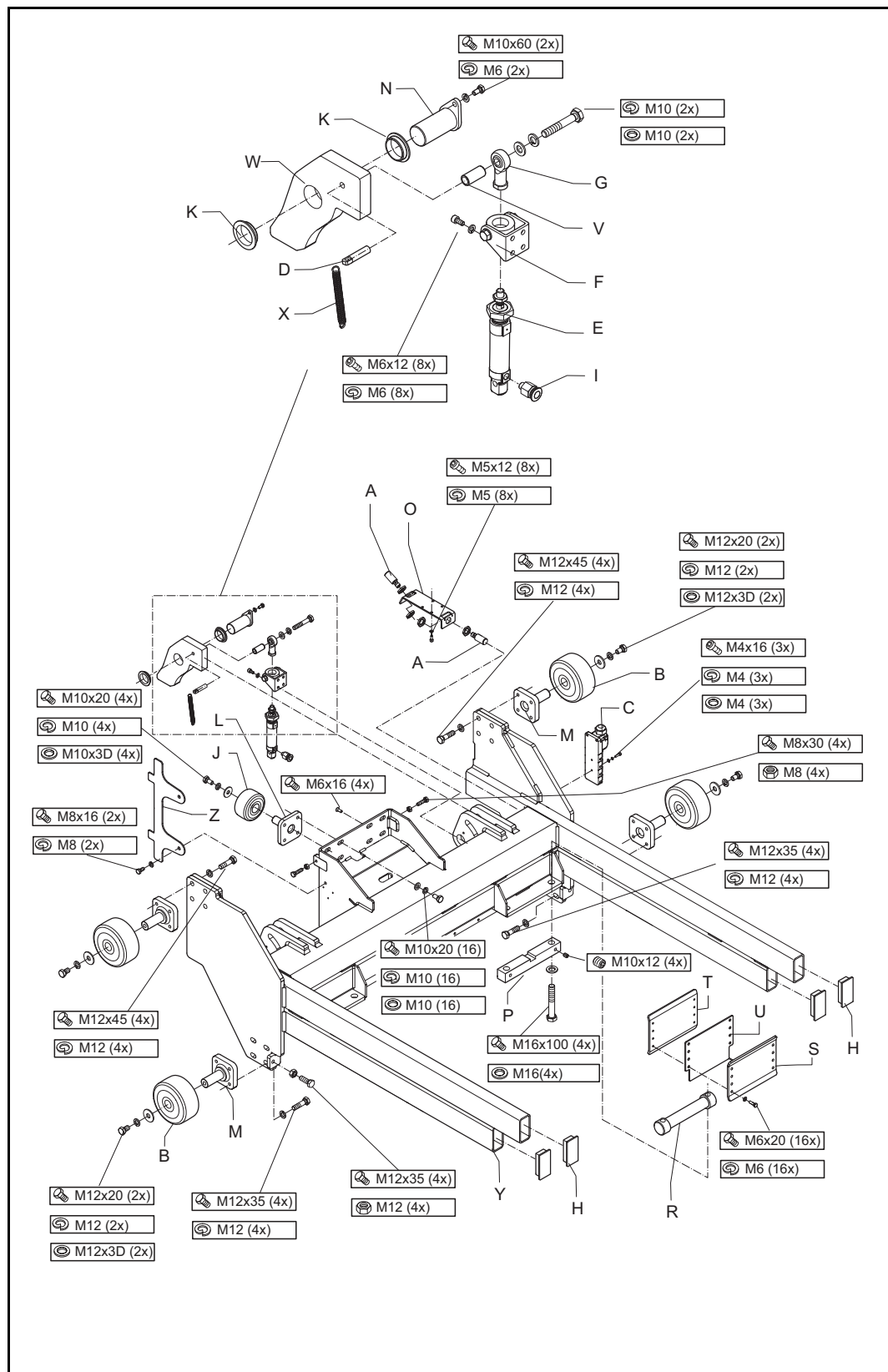


Bottom section parts list

Bottom section - parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	2	1000742	Pull handle	TS = 0.8 - 1.2 mm
B	1	AE000069302	Back shielding	H = 573
	1	AE000069303	Back shielding	H = 698
	1	AE000069304	Back shielding	H = 823
B1	1	AE000069308	Back shielding	H = 158
	1	AE000069306	Back shielding	H = 283
	1	AE000069307	Back shielding	H = 408
C	3	AE0000695	Mounting strip shielding	
I	2	1000932	Sensor	IME 18-08BPSZC0K
J	1	AE0000535	Bottom section	H = 1475
	1	AE0000541	Bottom section	H = 1725
	1	AE0000542	Bottom section	H = 1975
K	1	AE0000713	Threaded plate	2 x M5
L	1	1001532	Limit switch head	
M	1	1001531	Limit switch body	
N	1	1001533	Limit switch lever	
O	2	AE000068301	Running surface bottom	H = 1475
	2	AE000068302	Running surface bottom	H = 1725
	2	AE000068303	Running surface bottom	H = 1975
P	2	AE000067101	Strip fall protection	H = 1475
	2	AE000067102	Strip fall protection	H = 1725
	2	AE000067103	Strip fall protection	H = 1975
Q	2	AE0000690	Plate fall prot PRmk9	
R	1	AE000067801	Running surface bottom	H = 1475
	1	AE000067802	Running surface bottom	H = 1725
	1	AE000067803	Running surface bottom	H = 1975
S	2	AE0000711	Foot plate	
T	2	AE0000712	Endplate bottom section	

Bottom section attachment materials

Bottom section - attachment materials			
Quantity	Item number	Description (parts)	Notes
4	1000125	Hex nut	M10
26	1000147	Plain washer	M10
9	1000149	Plain washer	M8
4	1000150	Plain washer	M12
32	1000172	Spring lock washer sq ends	M10
24	1000193	Hex head bolt	M10 x 20
8	1000195	Hex head bolt	M10 x 30
9	1000209	Hex head bolt	M8 x 16
2	1000275	Hex socket head screw	M5 x 45
2	1000396	Spring lock washer sq ends	M5
9	1000398	Spring lock washer sq ends	M8
3	1000973	Prev torque type hex nut	M6
4	1001325	Hex nut	M12
4	1002982	Blind rivets	4 x 10
3	1003918	Hex bolt	M16 x 16
4	1004443	Hex head bolt	M12 x 100



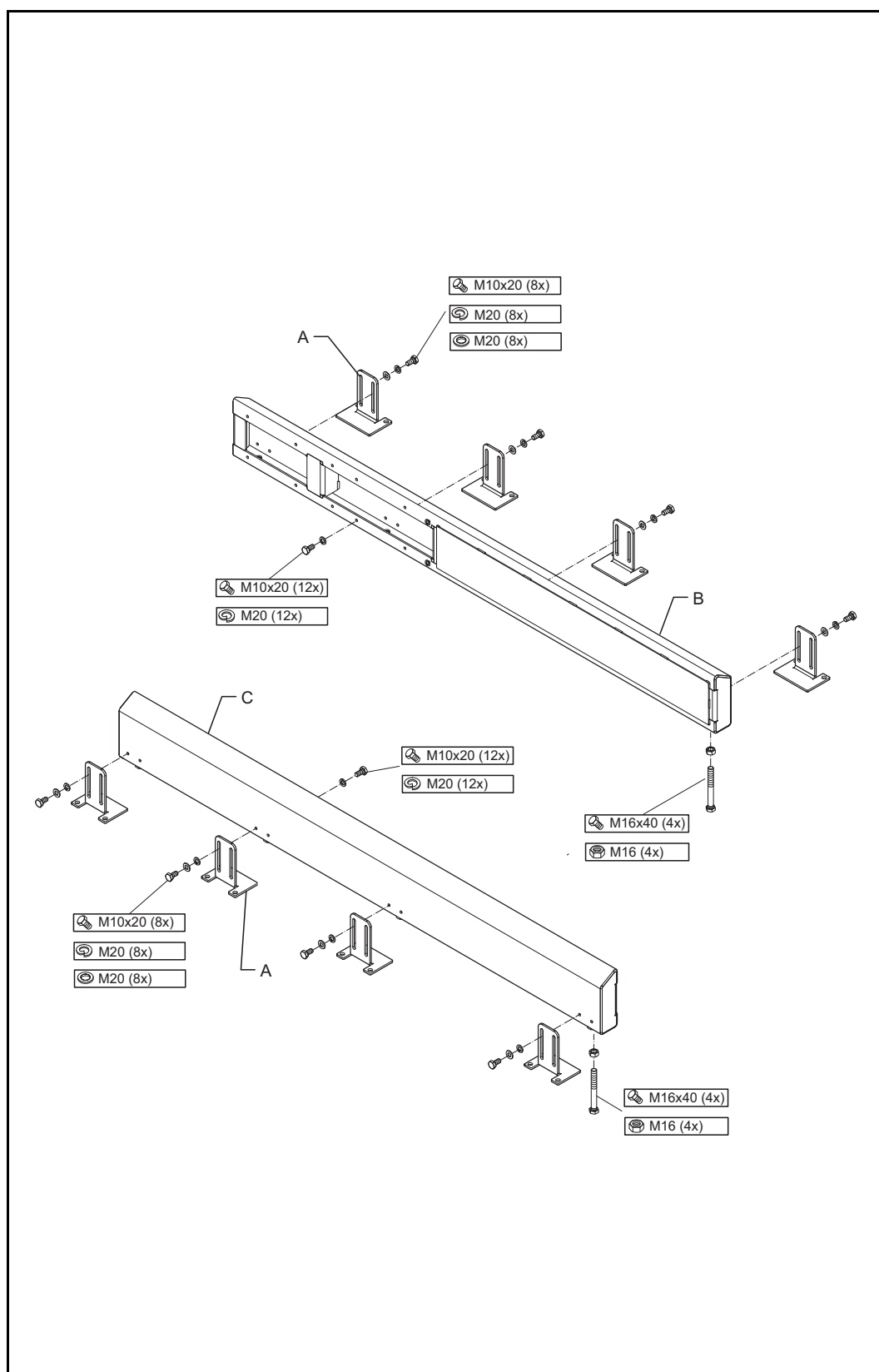
Carrier conveyor parts list

Carrier conveyor- parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	4	1000932	Sensor	IME18-08BPSZC0K
B	4	1002297	Wheel 125 x 55 bearing 25 x 60	
C	1	1003309	Exact 12-8 x M12 Junction box	
D	2	1003526	Bolt for extension spring	
E	2	1003527	Cylinder	ESNU-25-25-P-A
F	2	1003528	Pivot pin	SBN-20/25
G	2	1003529	Rod eye	M10 x 1.25
H	4	1003533	Tube cap rectangular	80 x 40
I	2	1003981	Pusg-in fitting	QS-1/8-10
J	4	1005551	Wheel 80 x 40 bearing 20 x 45	
K	4	1005552	Bearing Iglidur	G 30/34 x 9
L	4	AE0000548	Mounting bracket wheel	
M	4	AE0000549	Mounting bracket wheel	
N	2	AE0000552	Hinge fall protection	
O	2	AE0000722	Bracket detection	
P	2	AE0000736	Detection bar	
R	2	AE0000737	Linking shaft	
S	2	AE0000738	Clampingplate belt front	
T	2	AE0000739	Clampingplate belt back	
U	2	AE0000740	Clampingplate belt mid	
V	2	AE0000742	Spacer for rod eye	
W	2	AE0000744	Pin fall protection	
X	2	AE0000746	Spring	d=2.5 Dm=8.6 L0=68.5
Y	1	AE0000782	Carrier conveyor	
Z	1	AE0001248	Detection vane sensor	

Carrier conveyor attachment materials

Carrier conveyor - attachment materials			
Quantity	Item number	Description (parts)	Notes
18	1000147	Plain washer	M10
8	1000150	Plain washer	M12
4	1000151	Plain washer	M16
22	1000172	Spring lock washer sq ends	M10
20	1000173	Spring lock washer sq ends	M12
26	1000174	Spring lock washer sq ends	M6
4	1000177	Countersunk head screw	M6 x 16
20	1000193	Hex head bolt	M10 x 20
2	1000208	Hex head bolt	M6 x 12
2	1000209	Hex head bolt	M8 x 16
4	1000271	Plain washer	3d M10
8	1000273	Hex socket head screw	M5 x 12
4	1000327	Hex nut	M8
8	1000396	Spring lock washer sq ends	M5
2	1000398	Spring lock washer sq ends	M8
16	1000897	Hex head bolt	M6 x 20
4	1000974	Hex head bolt	M8 x 30
8	1000975	Hex head bolt	M12 x 45
10	1001022	Hex head bolt	M12 x 35
8	1001312	Hex socket head screw	M6 x 12
4	1001323	Hex head bolt	M12 x 20
2	1001325	Hex nut	M12
3	1001676	Spring lock washer sq ends	M4
2	1002632	Hex head bolt	M10 x 60
3	1002661	Hex socket head screw	M4 x 16
3	1002670	Plain washer	M4
4	1003509	Plain washer	3d M12
4	1003726	Set screw hex socket	M10 x 12
4	1004288	Hex head bolt	M16 x 100

11.1.5 Support exploded view



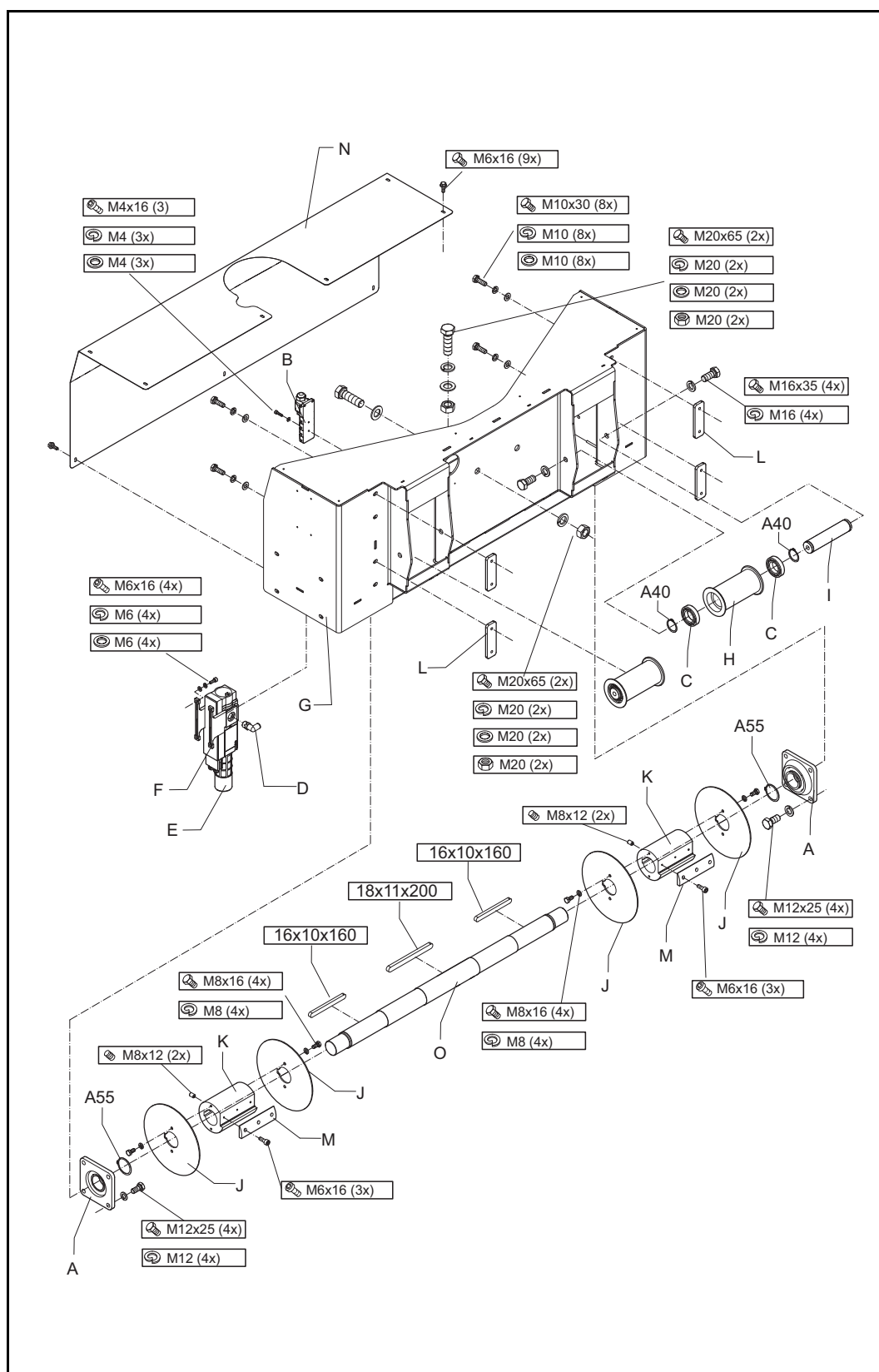
Support parts list

Support - parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	8	1000164	Adjustment tool	H = 156
B	1	AE0000624	Support right PRmk9	
C	1	AE0000640	Support left PRmk9	

Support attachment materials

Support - attachment materials			
Quantity	Item number	Description (parts)	Notes
8	1000126	Hex nut	M16
16	1000147	Plain washer	M10
40	1000172	Spring lock washer sq ends	M10
40	1000193	Hex head bolt	M10 x 20
8	1002368	Hex head bolt	M16 x 140

11.1.6 Drive section exploded view



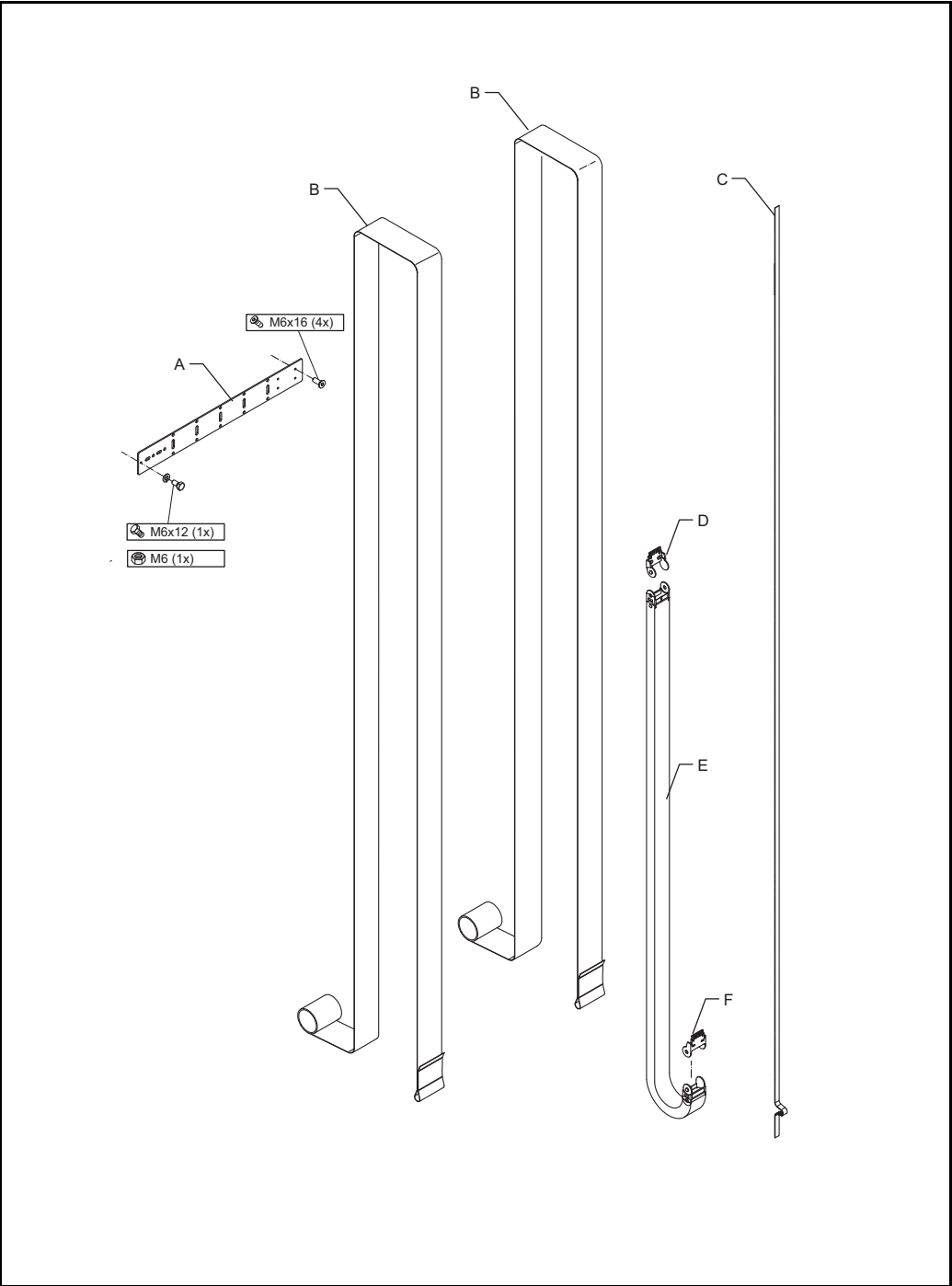
Drive section parts list

Drive section- parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	2	1002379	Housing unit	PCF50
B	1	1003309	Exact 12-8 x M12 Junction box	
C	4	1003534	Ball bearing	6008-2RS
D	2	1003982	Push-in fitting	QSL-1/2-10
E	1	1003983	Soft-start / quick exhaust valve	
F	1	1004038	Multi-pin plug socket	
G	1	AE0000558	Drive frame	
H	2	AE0000582	Idler belt	
I	2	AE0000583	Shaft idler belt	
J	4	AE0000585	Flange winding pulley	
K	2	AE0000586	Winding pulley	
L	4	AE0000590	Threaded plate	2 x M10
M	2	AE0000603	Plate winding pulley	
N	1	AE0000612	Shield plate drive	
O	1	AE0001084	Shaft winding pulley	

Drive section attachment materials

Drive section - attachment materials			
Quantity	Item number	Description (parts)	Notes
8	1000147	Plain washer	M10
4	1000148	Plain washer	M6
4	1000152	Plain washer	M20
8	1000172	Spring lock washer sq ends	M10
8	1000173	Spring lock washer sq ends	M12
4	1000174	Spring lock washer sq ends	M6
8	1000195	Hex head bolt	M10 x 30
8	1000200	Hex head bolt	M12 x 25
4	1000206	Hex nut	M20
8	1000209	Hex head bolt	M8 x 16
10	1000276	Hex socket head screw	M6 x 16
4	1000385	Set screw hex socket	M8 x 12
8	1000398	Spring lock washer sq ends	M8
4	1000883	Spring lock washer sq ends	M16
3	1001676	Spring lock washer sq ends	M4
4	1002372	Circlip	A40 1.75
3	1002661	Hex socket head screw	M4 x 16
3	1002670	Plain washer	M4
4	1003013	Spring lock washer sq ends	M20
4	1003512	Hex head bolt	M16 x 35
4	1003514	Hex head bolt	M20 x 65
9	1003918	Hex head bolt	M6 x 16
2	1005290	Circlip	A55 2
1	1005291	Parallel key	18 x 11 x 200
2	1005292	Parallel key	16 x 10 x 160

11.1.7 Belts exploded view



Belts parts list

Belts- parts list				
Pos	Quantity	Item number	Description (parts)	Notes
A	1	AE0001390	Strip	
B	2	AE000129214	Belt	
C	1	AE0001433	Strip	
D	1	AE0001337	Cable track connection set	
E	1	AE0001383	Cable track link	
F	1	AE0001336	Cable track connection set	

Belts attachment materials

Drive section - attachment materials			
Quantity	Item number	Description (parts)	Notes
1	1000973	Prec torque type hex nut	M6
1	1000208	Hex head bolt	M6 x 12
4	1000177	Countersunk head screw	M6 x 16

12 Electrical circuit diagrams

12.1 Drives

12.1.1 Lift drive type: SEW 3PH

Connection main power:

<http://www.productliften.nl/media/text/240/247/680010306.pdf>

Connection TF:

<http://www.productliften.nl/media/text/240/247/681510306.pdf>

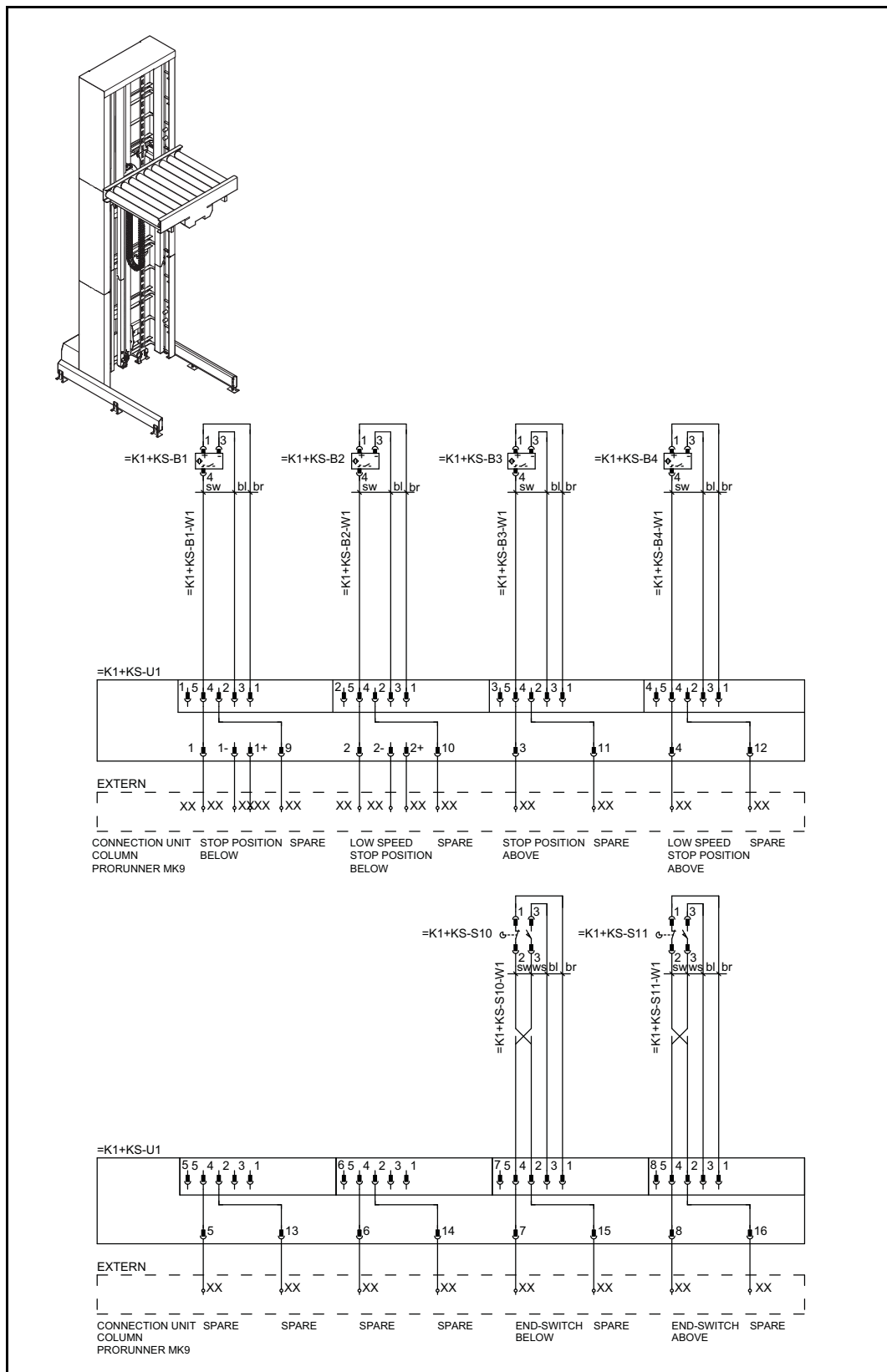
Connection BR:

<http://www.productliften.nl/media/text/240/247/69001006.pdf>

Other connection diagrams DR:

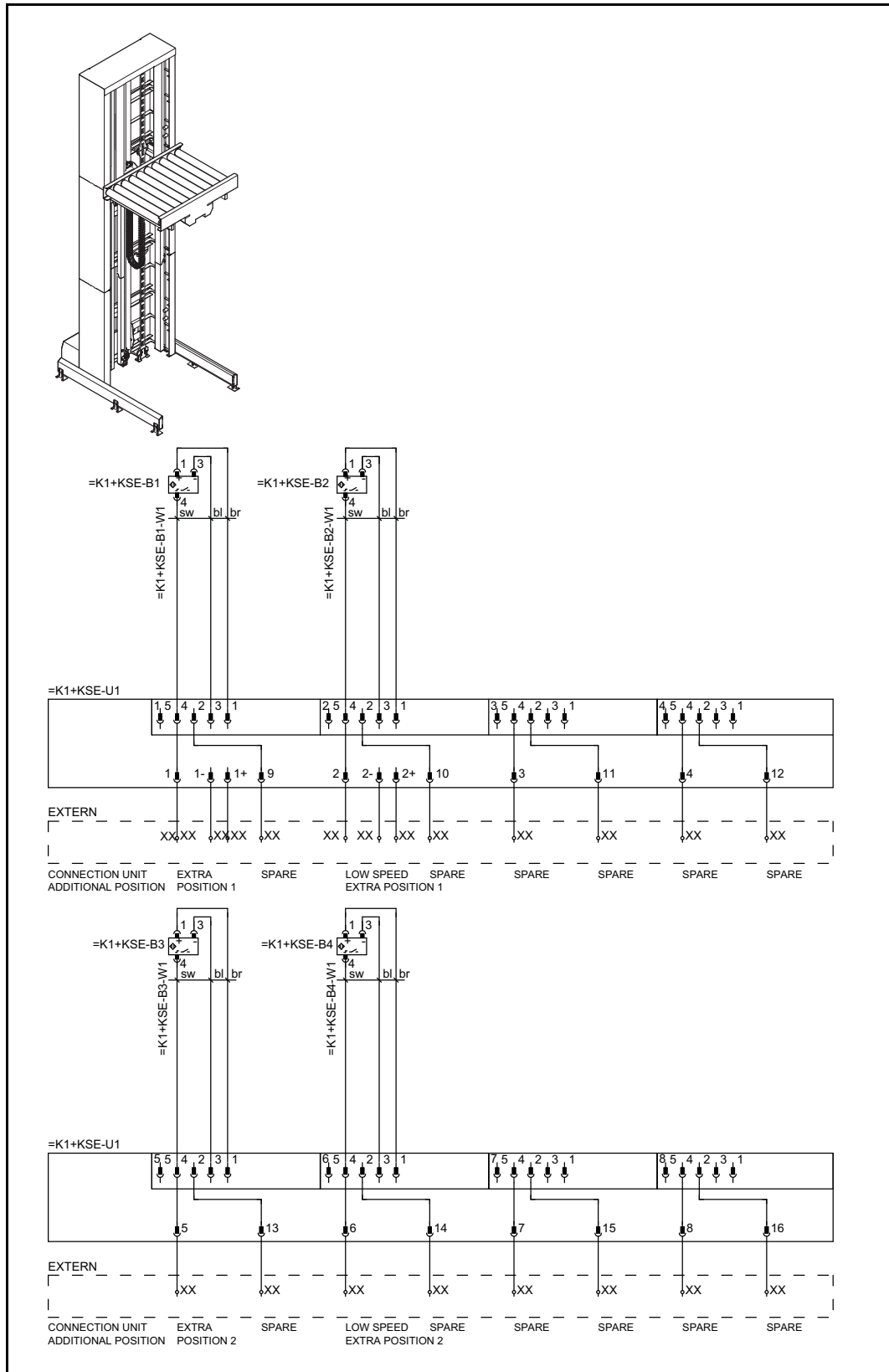
<http://www.productliften.nl/media/text/240/247/9pd0058us.pdf>

12.2 Column K1 / KS



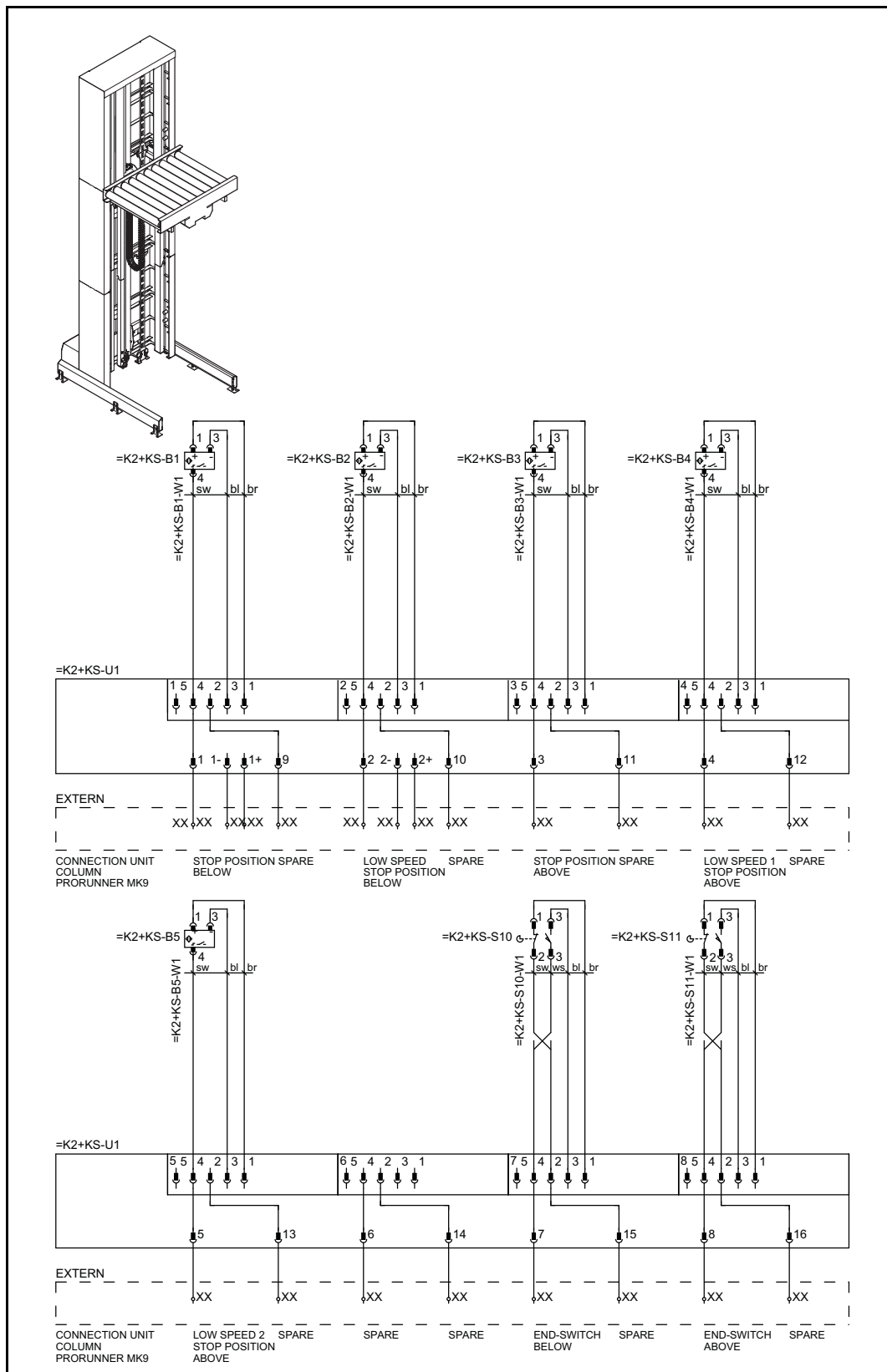
Position	Amount	Article number	Discription
	1		M12 Plastic lock screw
-B1	1	1000932	Inductive proximity sensor
-B1-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B2	1	1000932	Inductive proximity sensor
-B2-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B3	1	1000932	Inductive proximity sensor
-B3-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B4	1	1000932	Inductive proximity sensor
-B4-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-S1	1	1000355	Safety switch 2x NC, IP67
-S1	1	1000898	Operation key for use with AZ16
-S10	1	1001531	Limit switch basic contact element, M12 connector
-S10	1	1001532	Limit switch control head
-S10	1	1001533	Limit switch lever
-S10-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-S11	1	1001531	Limit switch basic contact element, M12 connector
-S11	1	1001532	Limit switch control head
-S11	1	1001533	Limit switch lever
-S11-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-U1	1	1003309	Exact12, 8-fold, 5-pole, M12

12.3 Column K1 / KSE



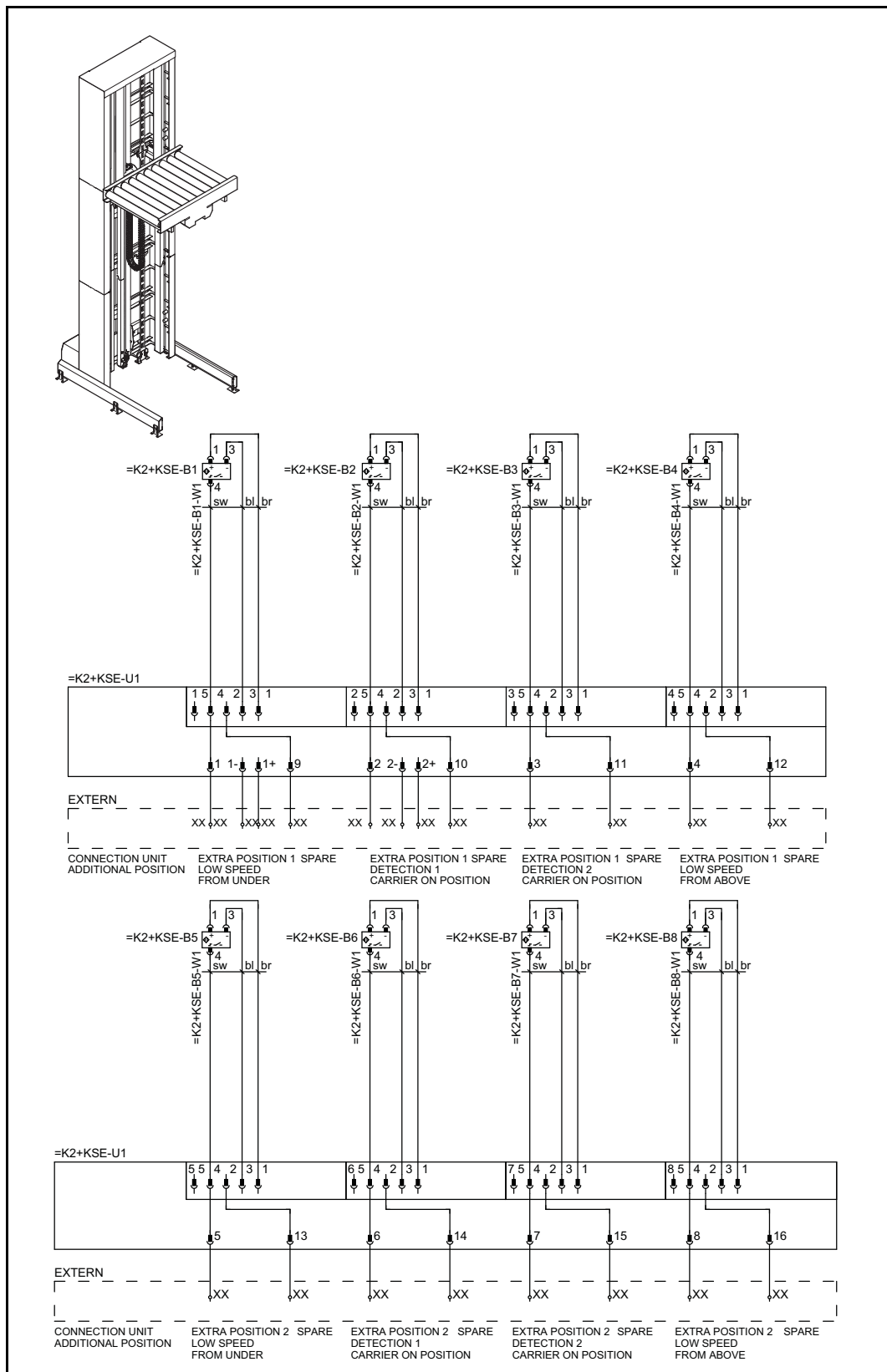
Position	Amount	Article number	Discription
	1		M12 Plastic lock screw
-B1	1	1000932	Inductive proximity sensor
-B1-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B2	1	1000932	Inductive proximity sensor
-B2-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B3	1	1000932	Inductive proximity sensor
-B3-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B4	1	1000932	Inductive proximity sensor
-B4-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-U1	1	1003309	Exact12, 8-fold, 5-pole, M12

12.4 Column K2 / KS



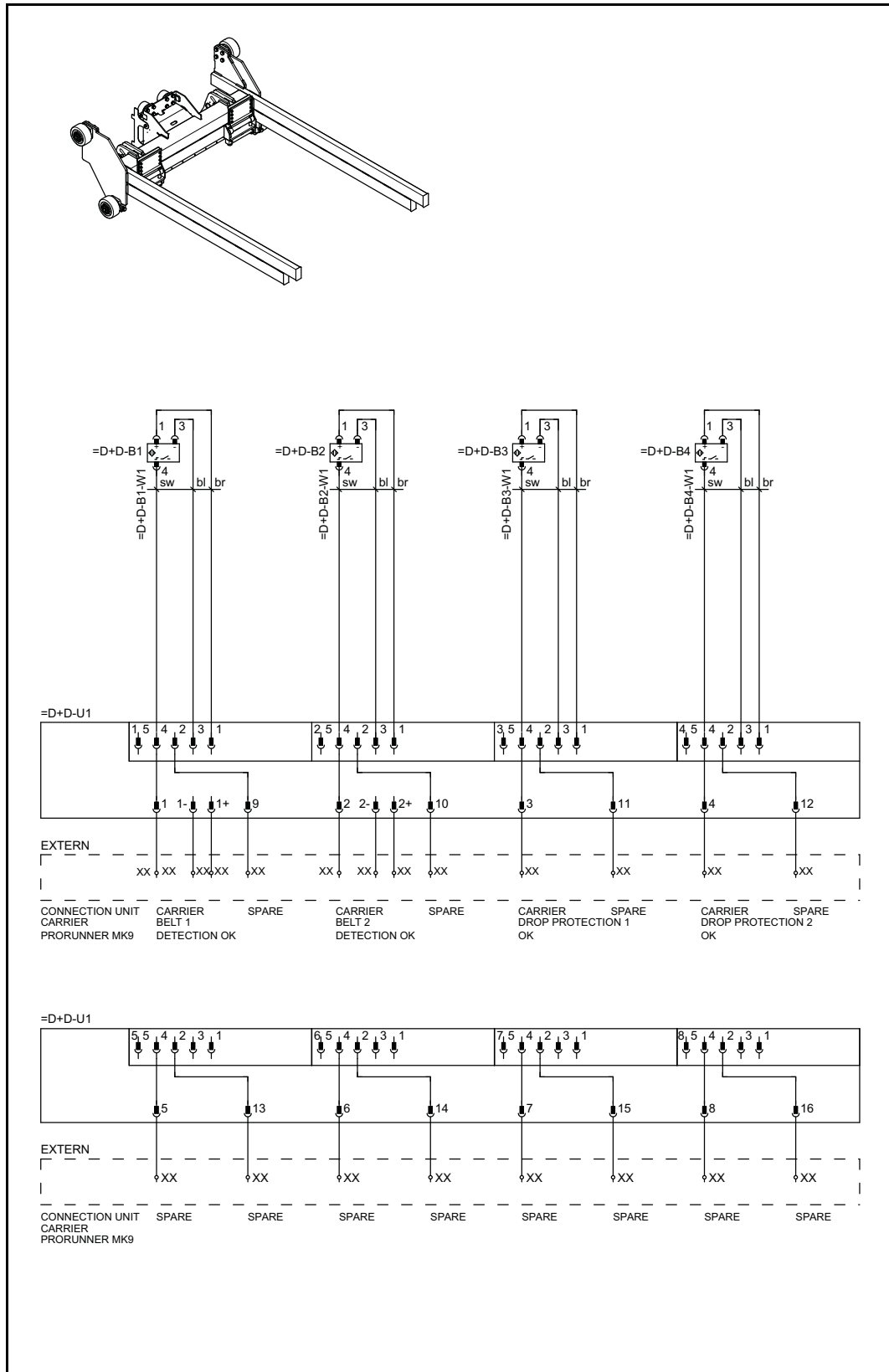
Position	Amount	Article number	Discription
	1		M12 Plastic lock screw
-B1	1	1000932	Inductive proximity sensor
-B1-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B2	1	1000932	Inductive proximity sensor
-B2-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B3	1	1000932	Inductive proximity sensor
-B3-W1	1	1001600	Prefab cable, PVC, 10 meter, connector M12 male + female, 4-pole
-B4	1	1000932	Inductive proximity sensor
-B4-W1	1	1001600	Prefab cable, PVC, 10 meter, connector M12 male + female, 4-pole
-B5	1	1000932	Inductive proximity sensor
-B5-W1	1	1001600	Prefab cable, PVC, 10 meter, connector M12 male + female, 4-pole
-S1	1	1000355	Safety switch 2x NC, IP67
-S1	1	1000898	Operation key for use with AZ16
-S10	1	1001531	Limit switch basic contact element, M12 connector
-S10	1	1001532	Limit switch control head
-S10	1	1001533	Limit switch lever
-S10-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-S11	1	1001531	Limit switch basic contact element, M12 connector
-S11	1	1001532	Limit switch control head
-S11	1	1001533	Limit switch lever
-S11-W1	1	1001600	Prefab cable, PVC, 10 meter, connector M12 male + female, 4-pole
-U1	1	1003309	Exact12, 8-fold, 5-pole, M12

12.5 Column K2 / KSE



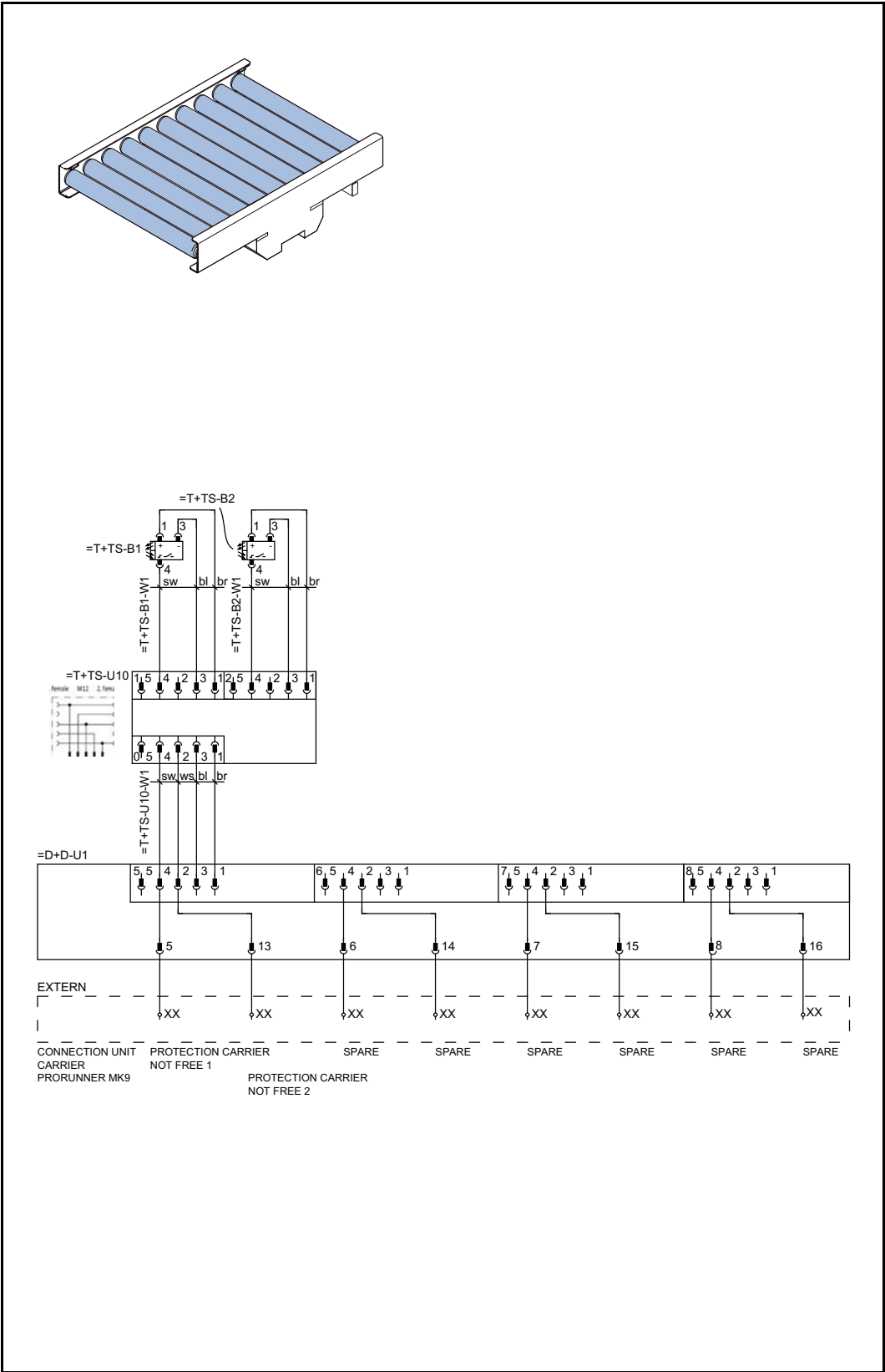
Position	Amount	Article number	Discription
	1		M12 Plastic lock screw
-B1	1	1000932	Inductive proximity sensor
-B1-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B2	1	1000932	Inductive proximity sensor
-B2-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B3	1	1000932	Inductive proximity sensor
-B3-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B4	1	1000932	Inductive proximity sensor
-B4-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B5	1	1000932	Inductive proximity sensor
-B5-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B6	1	1000932	Inductive proximity sensor
-B6-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B7	1	1000932	Inductive proximity sensor
-B7-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90° + M12 female 90°, 4-pole
-B8	1	1000932	Inductive proximity sensor
-B8-W1	1	1001326	Prefab cable, PVC, 5 meter, connector M12 male 90° + M12 female 90°, 4-pole
-U1	1	1003309	Exact12, 8-fold, 5-pole, M12

12.6 Carrier D



Position	Amount	Article number	Discription
	1		M12 Plastic lock screw
-B1	1	1000932	Inductive proximity sensor
-B1-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B2	1	1000932	Inductive proximity sensor
-B2-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B3	1	1000932	Inductive proximity sensor
-B3-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-B4	1	1000932	Inductive proximity sensor
-B4-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole
-U1	1	1003309	Exact12, 8-fold, 5-pole, M12

12.7 Conveyor on carrier T / TS



Position	Amount	Article number	Discription
-B1	1	1002097	Reflex sensor
-B1	1	1002242	Reflector
-B1-W1	1	1003307	Prefab cable, PVC, 1 meter, connector M12 male + female M8 straight, 4-pole
-B2	1	1002097	Reflex sensor
-B2	1	1002242	Reflector
-B2-W1	1	1003307	Prefab cable, PVC, 1 meter, connector M12 male + female M8 straight, 4-pole
-U10	1	1003313	T-Coupler 5p Male M12 / 2x 4p Female M12
-U10-W1	1	1001601	Prefab cable, PVC, 1 meter, connector M12 male 90°+ M12 female 90°, 4-pole

13 Pneumatic circuit diagrams

The PRmk9 can be fitted with several pneumatic features. These include a fall protection, pallet centring on the conveyor and a pallet stopper on the conveyor. Below is a short explanation and pneumatic drawing of these features.

13.1 Fall protection

For a pneumatic drawing of the fall protection see *Fig. 1*. When power is applied to the fall protection, compressed air goes to the cylinders and the fall protection retracts. This will be applied until the emergency stop circuit is triggered or a power failure occurs. When this happens air will rapidly flow out of the cylinders and the fall protection will hook into the column, hence holding the carrier into its position.

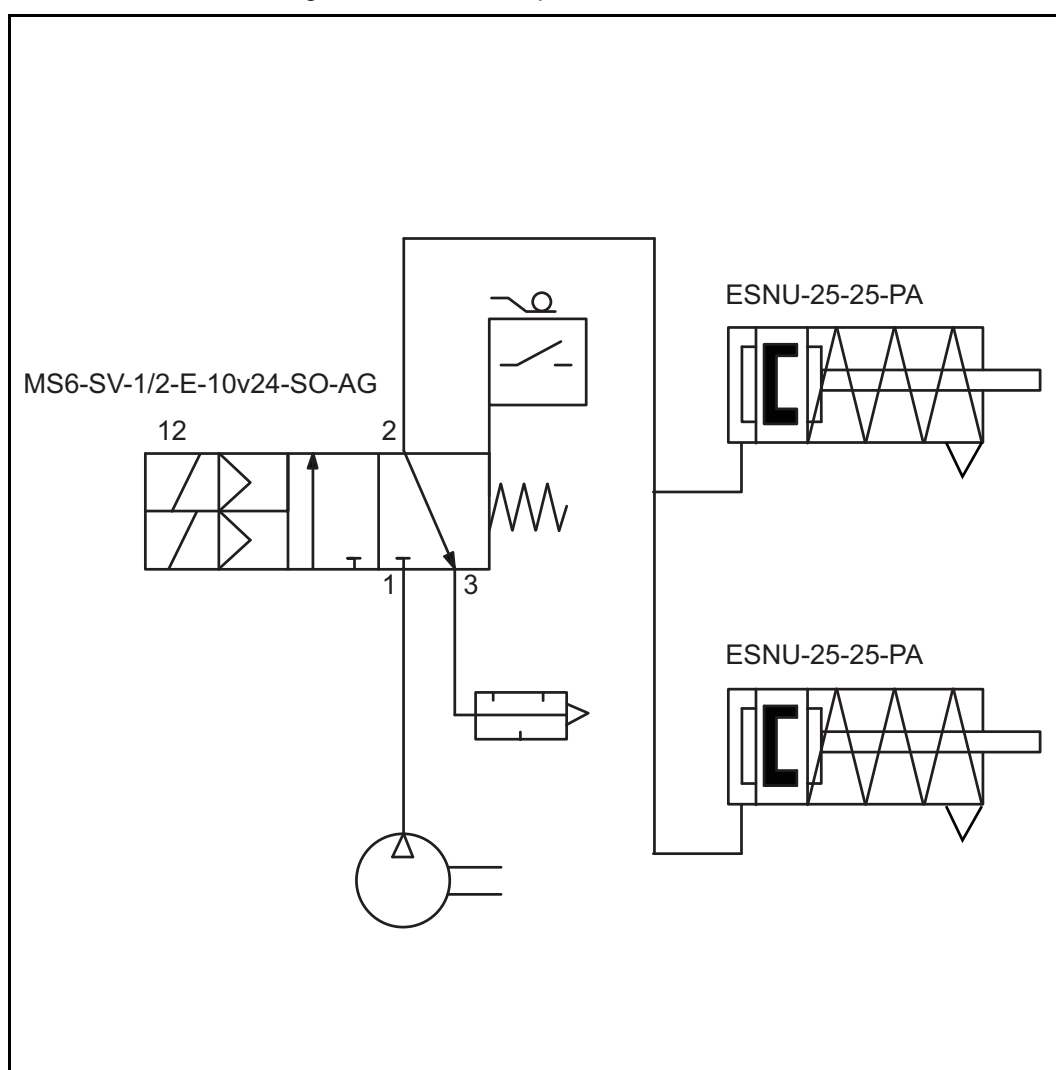


Fig. 1 Pneumatic drawing fall protection

13.2 Pallet centring

13.3 Pallet stopper

14 Assembly instruction

14.1 Assembly instruction

Qimarox delivers the assembly instruction separately.

15 Appendix

15.1 Product registration form

Fill in this form and send it to support@qimarox.com for correct product registration.

Machine type *	Mk 1	Mk 5	Mk 9
Order number Qimarox			
Serial number			
Integrated by			
Order number integrator			
Installation date			
Start production date			
Your reference (line / machine number)			
Contact details user			
Company name			
Address			
Zip code			
Town / city			
Country			
Phone number			
Fax number			
e-mail			
website			
Technical contact user			
First name			
Last name			
Function			
e-mail			
Phone number			
spare parts ordered *	yes	no	
contact for service contract *	yes	no	

* Draw a circle around the choice.

REMARKS

THIS FORM IS USED TO INFORM THE USER OF QIMAROX PRODUCTS ABOUT MODIFICATIONS ON THE USED EQUIPMENT AND TO IMPROVE OUR SERVICE ON THE EQUIPMENT. THE CONTACT BETWEEN USER AND QIMAROX WILL BE THROUGH THE SUPPLIER / INTEGRATOR.



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